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THE PAPER TRADE JOURNAL.

"The Consumption of Paper is the Measure of a People's Culture."

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Trade Topics.

Metallic Rod Packing.

[WRITTEN FOR THE PAPER TRADE JOURNAL.]

BY W. H. WESTON.

The advantages of metallic piston rod packing render it of especial importance in positions where grit, dirt and dust can get to the rods and thus to the packing, as well as in almost all places where packing is needed for a rod. The great rapidity with which piston rods wear into grooves along their length, and out of shape in all directions, when grit of any sort can reach them, is apparent to all who have had experience in such places. This is specially the case in railway engines, where the cinders and the dust from the road get to them. With the old form of soft packing in the stuffing box the rods are soon out of shape, this of course being caused by the grit being carried by the rod into the packing, where it is imbedded and grinds into the rod during the successive strokes of the piston.

The same thing happens in other positions to a less but nevertheless to a considerable extent, the result being in such instances that after the piston rod is grooved and worn the packing has to be renewed very often in order to keep a steam or water tight connection. This frequent replacing of the packing is troublesome and costly. In course of time the rods must be taken out and returned. This occasions loss of time and the expense of doing the necessary work.

While employed on a railway some years ago I put metallic piston rod packing onto a good many engines and it gave the best results. In an engine using the old soft packing the rods become seriously worn in two or three months' running, so that repacking must be done very often, sometimes every day, and when an engine comes into the shop for repairs at the end of eighteen or twenty months the rods have to be turned down so much in order to bring them to a perfect shape again that a few such turnings leave them too small for the work they must stand, and the result is the expense of replacing them by new rods. This amounts to a large figure, especially where the number of engines is high up in the hundreds. It was found that with metallic packing an engine would run for twenty months, and then come into the shop with the piston rods in almost as perfect a condition as the day they were first turned, while during the running of the engine the packing would scarcely ever need any attention further than a little oil, there being no repacking to be done, and the studs would have to be touched or the packing looked at only occasionally. In most cases the packing would run continuously for months without the least overhauling.

The great success of this kind of packing seems to be in the fact that the dirt which collects on the rod is not carried inside of the rings, but is simply scraped off the rod at each stroke and falls outside of the stuffing box. The rings also form a steam or water tight joint by close contact with the rod, and not by being squeezed against the rod by heavy pressure, as is the case with the old soft packing.

Metallic packing makes a tight, easy working joint, without any pressure between it and the rod; it simply seals by close, even contact around the rod surface, and if properly made it is steam and water tight under the heaviest pressures, and also under high piston speed. It is an easy matter in buying a new engine to order it with metallic packing, and if old engines are to be fitted with it this can usually be done very easily if the engine is not of too outlandish a shape. Some makers of the packing will utilize the old glands, and others will supply new glands but use the old studs, so that the cylinder head need not have any change made in it in either instance.

Packing made by using a number of rings set together and cut cone shaped on the outside is a highly commendable form; the rings are set into a cup or casting bored to a taper inside so as to correspond to that of the rings, the cup having sufficient lateral movement to allow for any movement of the rod which might happen in that direction. The packing rings are held and pressed into the cup by a suitable spring, the cone shape closing them down onto the rod as they are pressed into it.

Most forms of metallic packing are perfectly simple and of few parts, so that they are easily put in and adjusted. A thing often neglected in putting in this kind of packing is to carefully draw-file the rods before it is put on. Much trouble has been experienced by the starting of this packing in various places, because those in charge of the work did not know that putting the rod in good shape to start with is a necessary item. The cost of an hour's work to draw-file a rod is money saved, because the rod thus equipped will run for months under the severest conditions without getting out of round or apparently wearing at all. Taken on a stationary mill engine it would run for years without any appreciable wear in any way, and it would last without attention for an indefinite time as compared with the use of the old soft packing.

No matter what the size of the rod may be, the metallic packing can be fitted to any size, from the largest marine to the smallest stationary engine. And it is a very serious mistake for a concern not to order all new engines to be built with metallic packing, whatever the work they are to do.

Sulphite Fibre Separator.

This machine is a modification of an improvement upon a machine for separating wood pulp, and is specially adapted to the manipulation of sulphite fibre.

Figure 1 is an elevation of the machine, partly in section; Fig. 2 is a sectional plan view on line x—x of Fig. 1, with the worm omitted. Fig. 3 is a sectional view on line x'—x' of Fig. 1. Fig. 4 is a sectional view on line x^2—x^2 of Fig. 1. Fig. 5 is a sectional view through the drum and worm on line x^3—x^3 of Fig. 1.

A represents a case or trough which is constructed so as to be water tight.

B represents a metallic foraminous drum, the holes therein being of such size and shape as is best adapted to perform the work of the device.

C is a shaft carrying by means of appropriate supports or spokes an internal worm D.

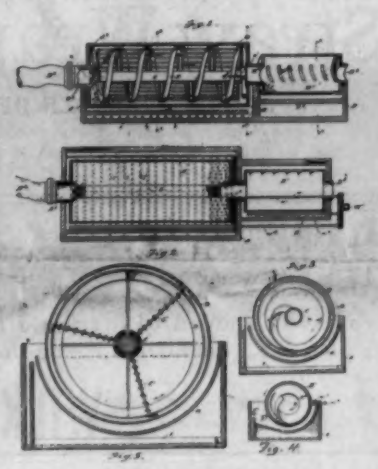
E is a supplemental or continuation of the case, and carries within it a secondary foraminous drum, B'. This is constructed substantially like the drum B, except that preferably the holes are smaller.

The drum B has at B^2 a hollow trunnion or bearing upon which it is supported. The head of the drum B is perforated centrally, and from the edges of the perforations project inwardly arms b', which are cast integral with the head. These arms unite in a hub, b^2, into which the shaft C is keyed in the usual form. Attached to the hollow trunnion B^2 by an appropriate stuffing box is an inlet tube, B^3, adapted to receive the material to be operated upon by the apparatus, but convey it to the interior of the drum B.

In the case A there is a trough, a, which does not extend quite to the end of the casing at the tail of the machine, leaving an opening a'. This trough is concentric with the drum B, and is separated therefrom by a small space of an inch or more. This is shown in cross section in Fig. 3. Below the trough a is a series of transverse slats, s, s, s, extending alternately nearly across the width of the casing A, as shown in Figs. 2 and 5.

At B^4 is another hollow trunnion, which is enlarged and serves as the head to the drum B. At its opposite end it is also enlarged, making a head for the drum B', the whole being preferably cast in one piece. The shaft C is flanged at the corresponding end, and at c is firmly attached to the head B^4. The extreme end of the shaft at c' is hollow, as shown by the dotted lines, and entering therein, it has an opening at the side c^4, as shown in Fig. 1, into which the extreme end of the worm D enters.

The worm D is angular in cross section, which is shown at d^3, one flange being concentric and the other flange being perpendicular to the periphery of the drum. The perpendicular flange is always toward the head of the machine. This form makes a right angled trough, and as the drum rotates in the direction of the arrow the perpendicular flange continually forces material from the head toward the tail of the machine, and as heavy material settles in the pulp it is caught by the longitudinal flange and held in the angle between the two until it is ultimately carried to the tail end of the shaft, where it is discharged at



SULPHITE FIBRE SEPARATOR.

d^2 out through the hollow trunnion B^4 and into the second drum B'.

Attached to the shaft C and at right angles thereto are rods or bars C' C'. Between these bars are located slats having a rectangular cross section. They are constructed so that the plane of the slats is at an angle with the perpendicular radii from the centre of the shaft C. They are all located alike, and in the same direction as shown in Fig. 5. As the shaft and drum worm and the slatted extensions turn in the direction of the arrow in Fig. 5, and as the water line is at the dotted line in Fig. 5 the action of the slats upon the water, by virtue of the angle which they make with the radii, is to drive the solid material from the outer portions of the drum toward the centre. In Fig. 1 only two of these slatted extensions are shown; it is the intention, however, to place them between each convolution of the worm throughout the whole extent of the shaft.

The drum B', smaller in diameter than B, is carried by a hollow journal at its outer end at B^5. This is made a portion of the cast head of the drum B', and forms an outlet for the discharge of material as hereinafter stated. Upon the inner surface of the drum B' are attached blades extending inwardly a short distance and located substantially as though they were portions of a true screw. They are so adjusted that the rotation of the drum in conjunction with the blades forces the material that is in the bottom of the drum toward the tail of the machine.

At the hollow journal B^5, and inside of the drum B', is located a screw conveyor in the form of a cycloid, the inner end commencing at the inner surface of the drum B', the front side being flanged and thence carried in a cycloidal form until its discharging end is brought toward the axis of the drum coincident with the inner surface of the hollow journal. The drum B' also revolves in a concave trough, E^2, of which one side is carried up, substantially conforming to the convexity of the drum, until it joins the case; the opposite side is raised slightly and joins a dam, F, as shown in Fig. 5. The height of the dam may be made adjustable by any of the well-known means for such adjustments.

The space between the dam and the case E forms a receptacle from whence preferably, in practice, the material carried over the dam may be conveyed back to the inlet at the head of the whole machine, although that is not essential.

The washing device is provided, the plan of which is shown in Fig. 2, which consists of a water pipe, W, which is connected with any convenient source of water supply having a head. Extending therefrom and located inside of the foraminous drum B' and parallel with its axis is a pipe, w, which is closed at its extreme end. Upon the side of this pipe, w, and facing the interior of the drum, is a series of small jet holes, w'. Parallel with the exterior of the drum B' is another jet pipe of similar construction, w^2. Extending from the common source of supply is another pipe, which faces the exterior of the drum B, and is marked w^3; this also has a series of jet holes similar to the others. Each of these pipes is controlled by an appropriate stopcock, which permits of the force of the jets to be regulated at will.

The jets serve to keep clear the perforations in the drums, and at the same time to furnish water to supply that which is carried over the dams, and thus keep the mixture within the drums in the proper state of dilution. Appropriate means is provided whereby the drums B and B' are rotated, but about which there is nothing new, and which may readily suggest itself to anyone acquainted with the state of the art, and which therefore is not shown or described.

The mode of operation of this device is as follows: Material consisting of sulphite fibre mingled in water is admitted through the hollow journal at the head of the drum B at B^3. After passing through the hollow trunnion B^3, it fills the drum B up to a level of the lowest point of the interior surface of the hollow trunnion, and very nearly to the shaft. The finer portions, together with the water, will pass through the perforations of the drum into the trough a.

The rotation of the drum carrying the worm, operating in conjunction with the angular slats, continually forces the larger particles in the mixture simultaneously toward the centre or axle, and longitudinally toward the tail of the machine, so that the centre is formed into a current carrying the larger particles toward the tail, while at the same time the finer particles are carried through the openings in the drum into the trough, as hereinbefore stated. The heavier, larger portions are caught by the worm and carried forward until they, with the other larger portions that are too light to fall through the water, are carried out through the hollow bearing B^4, and over into the secondary drum B'.

Some of the finer and available material for manufacture is also carried out through the hollow bearing B^4; for the purpose of saving this the second drum B' is provided. As already stated, this, having perforations of a smaller size than the drum B, permits the finer material only to pass through it into the concave underneath, whereas the coarser portions are worked to the tail of the machine by the flanged screw projections and by the so-called trough; thence they pass out through the tail of the machine at B^5.

The finer particles carried by water, after passing through the perforations in the drum B, pass out of the trough a into the bottom of the case A. At this point, it is compelled to circulate around and over the slats s s s, and, as the water level is of the height of the dam F, it finally rises in the interior of the case and runs in a thin stream over the dam F, and then to its appropriate receptacle.

The object of the slats is to permit the settling of any small but hard gritty substances or metallic scales, such as are necessarily incident to the manufacture of sulphite fibre. This separation is assisted also by taking out the material over the dam at the highest point of the water level.

Beaters and Beating.

[WRITTEN FOR THE PAPER TRADE JOURNAL.]

BY JAMES HALL.

That the science of paper making lies in the handling of the stock in the beaters goes without saying. Its manipulation in the engine is therefore of the very utmost importance; and this fact cannot be too greatly impressed upon those who have the management of them, if the best results are to be obtained.

During the last twenty years great alterations—some of them not being improvements—have been made in the beating engine; and yet we cannot say that this piece of mechanism is now perfect. The perfect beating engine, I believe, has yet to be made. It is true that many additions and alterations have enlarged considerably its power and efficiency; but it is to be feared that some of the earlier merits of the beater have been lost sight of or got overshadowed by modern innovations or improvements so-called.

At one time a beating engine carrying about 200 pounds was considered best suited for the work; nowadays it is made to carry all the way up to 1,000 and 1,200 pounds to the engine, and it is a trite question to-day which of these extremes is best.

In testing the merits of an engine and in all matters relating to its improvement two things have to be kept to the fore: (1) The beating of the stock in such a way as to secure the quality of the paper desired, and (2) the doing of this with a minimum of power—for no engine can be considered perfect or even passably good which requires a maximum of power to drive it.

I have seen a modern 1,200 pound engine which when the roll was down required 40 horse power to drive it! If a mill of three or four machines driven by steam depended for its stuff on beating engines such as this the coal bill would be something enormous, and certainly more than could be afforded on this item of expenditure.

This is not the only drawback to the adoption of such ponderous engines, even in respect to driving. Whatever may be the size of the beating engine, every beaterman knows that a steady drive is most essential to a successful manipulation of the stock; but in a beater room furnished with a large number of unwieldy engines, and especially where the motive power is not fully adequate to its work, the lifting of a roll or two or the putting of one or two down will have the effect of increasing or diminishing the speed in such a way as to seriously interfere with the proper treatment of the stock in the engine. Erratic driving of this kind is always to be avoided, and everything should be done to obtain a steady and uniform speed, just as much necessary in the beater room as in the machine department of any mill. It follows then that a maximum size of beating engine is not the best in the matter even of driving. It is, moreover, in my judgment not the best type of engine to use in any mill making the higher grades of paper. The only thing that can be said of the large engine is that it carries more stuff and contains a heavier roll, that it does not require filling so often as a smaller engine, and that when emptied it has a more appreciable effect upon the stuff chest, &c.

Taking all this for granted the question naturally arises, "Which engine does the work best in respect to preparing stock for the machine?" for this after all is the crucial test of the merits of any engine. The larger the engine and the longer it takes in beating this follows as a natural consequence. The roll of a large engine does not drive at more than from 160 to 180 revolutions per minute, and some of them not more than 150. The stuff having to travel such a long distance does not come under the

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roll so frequently as in an engine of half the size, hence the need of keeping it in the engine for a much longer period of time.

Then comes the question of lodgement. The engine, I fear, has yet to be invented in which there will not be some lodgement of stuff. Every maker claims for his engine an immunity from this evil; but there is only one that I have yet seen where it could be fairly said that there was no lodging of stuff. In most engines the stirring stick is a necessary evil, and some engines need it more than others; but in the engines carrying 1,000 pounds or 1,200 pounds it is simply impossible for any beaterman to keep his stuff from lodging; and to work the stirring stick at all in these thick and ponderous engines is a heavy task to which every beaterman is not equal. However much it may be used the stuff will accumulate somewhere, and when the stock goes down to the chest it is largely impregnated with raw and unbeaten stuff, which the refining engine cannot reduce to the same proportions as the remainder of the stock; and the result is that the stock does not pass so easily through the screens, nor close up so well on the wire, the sheet coming over the machine more or less cloudy when looked through.

Our forefathers used a beating engine carrying 200 pounds, and engines of this size are yet used by some of their descendants with very satisfactory results. Piries, of Aberdeen, have long had the reputation of making the best writing papers in the world. The stuff out of which their papers were made was beaten in engines not exceeding a capacity of 250 pounds, driven at about 220 revolutions to the minute, with sharp tackle and emptying every four hours. In so small an engine and driving at that speed the stuff comes under the roll about three or four times as often as in the 1,200 pound engine before noticed going at 160. Further, in an engine of this size there is no possible chance of the stuff lodging, the stirring stick of the beaterman keeping it all in motion, and without any very great amount of labor as compared with that required in the larger engine.

The result of such beating was that the paper was thoroughly uniform in texture as well as strong and wiry; and this, it must be remembered, was all done in the engine, for there were no "Jordans" nor "Marshalls" in those days to supplement the beating or to remedy the defective work of the large and unwieldy engines of the present day, the working of which haf certainly rendered the use of refining engines an absolute necessity.

I do not wish to be understood as recommending the use of so small an engine as 200 pounds, but were I erecting a paper mill for book or writing papers of the better kind I would not have a beating engine in the mill carrying more than 400 pounds. At the Aberdeen mills the smaller engines referred to were superseded by larger ones; but the deterioration in the paper in consequence led to the readoption of the original size. A 400 pound engine is plenty large enough for the beaterman to manage, and the stock may be got out of one of this size, traveling, say, not less than 180 or 190 turns per minute, in such a way as to dispense, if necessary, with any sort of refiners afterward. An engine of this size travels better; the ingredients — clay, alum, starch, size and coloring matter—have a much better chance of permeating the stock than in an engine of larger capacity; and the roll, say, 3 feet 6 inches surface, and about the same in diameter, will be sufficiently heavy to do the beating in an efficient and satisfactory manner.

Correspondence.

MIAMI VALLEY.

[FROM OUR REGULAR CORRESPONDENT.]

DAYTON, Ohio, August 2, 1894.

Although surprising in general, trade is noticeably improving in this valley. Its rate is not remarkably fast, but sufficiently so to revive hopes for a substantial fall business. At present the lethargic inclinations —compulsory of course—of the Miami Valley paper manufacturers are not in evidence. They usually brush the cobwebs from their eyes when aided by the slightest encouragement.

In last week's correspondence I mentioned the organization of a company for the purpose of manufacturing burial caskets. It seems that experts in all pulp mills in the world have for several years been working with this object in view. In Dayton particularly has the progress been notable and successful. Machines for the experiment were constructed in the city and the experiments with pulp and chemicals have been made in the Hawes paper mill, North Dayton. Success crowned the efforts of those concerned and patents have been secured. After advancing carefully in covering their process with legal safeguards an organization was effected.

The capital stock of the company is $500,000, and it is understood that this amount has all been taken. It will be an immense concern, and Niagara Falls parties are offering big inducements to secure the location of the shops. All indications point to a successful venture.

The process is considered perfect and is completed by pressure — no molding. Twenty-five sample caskets, all made in this city, were sent to Cincinnati. The caskets are light, airtight and waterproof, and the material is from 300 to 400 times as strong as the wood from which it is made. The pulp of wood and straw is fed to the machine, pressure is put on, then steam for drying, and the box comes out complete. with no chance of failure. The casket may be made in imitation of any wood, in one solid piece, while the lid makes another separate part.

Machines will be made to manufacture about 2,000 caskets a day, and the trade will receive an impetus in the output also of baby cabs, tubs, buckets, &c. Inasmuch as the material is inexhaustible the enterprise should be long lived. F. J. Dunbar, a member of the company, is now in Europe on business in connection with the venture. Companies will be organized in Germany, Russia and France.

"The seventeenth annual meeting at Saratoga was a lively one," remarked a Dayton paper manufacturer yesterday, "but I don't believe there were many Miami Valley representatives there. Usually in busy times those sessions are left to care for themselves, but I see no reason why the entire trade should not have been in attendance. The meetings are, generally speaking, very instructive and withal socially agreeable. By the way," continued he, "THE PAPER TRADE JOURNAL deserves credit for the gallant manner in which the meeting was handled. The complete account bespoke volumes for its enterprise."

The Harding Paper Company, of Franklin, has received probably the largest order for paper ever shipped from this valley. The order is for fine writing paper and comes from far away South America. The shipment will weigh 80 tons. It is rumored that the same firm has another deal under way, which, if completed, will outshine the big order above mentioned. There is no use for the outside world to deny that the Miami Valley is rich in recognition and versatility. Did not Howard Friend supply the World's Fair with a consignment of paper so stupendous that it made you dizzy to think about it?

The Aull Brothers Paper Company's grit, enterprise, energy, stick-to-it-iveness—all masterly attributes—are contained in that firm name. Although damaged to the extent of over $20,000 by fire and water last week, this firm is again in operation. The new place is located on Second street, scarcely a square from the old location. These quarters have been secured temporarily, and the management states that if the progress of mechanical skill is uninterrupted, the handsome new five story factory will be ready for occupancy by the first of the year. At present the foundations only bear out this statement, but the invinceableness of the proprietors is sufficient to assure success.

There were several peculiar incidents in connection with the Aull Brothers fire. In the first place Box 13, at the Beckel House, was first pulled. The significance of this fact is bold enough on its face. Then on the morning of the same day Rudolph Wolf, foreman of the establishment, received a message from Wilmington, N. C., giving information of the death of his daughter, Mrs. W. L. Kinney. A short time previous Joseph Turner suffered a crushed hand in a stamping machine. One hour before the fire W. J. Aull left for a summer resort, while on the morning of the same day John W. Aull skipped out on a business trip to New York.

Sam'l F. Margerum, trustee of the Gunckel Banking Company, has filed his first account. Mr. Gunckel's friends in the paper trade will peruse it with interest in the following briefly summarized form:

Amount received, $1,846.31; expended, $864,48; balance on hand, $981,83.

Total of all claims due, $51,441.57; taxes due, $983 88; total, $52,425.39.

Uncollected claims due, $1,450.07; claims subject to pending suits, $12,321.74.

Claims reduced to judgments, $62,572.79.

Bonds and stock in hands, $10,200.

Notes in hands of creditors as collateral, $11,402.57.

Collateral to secure credits, face value, $76,294.42.

It is a source of gratification to know that the Amanda tissue paper mill will be in operation shortly. Fires were built under the boilers this week for the first time since the smash of the United Paper Company. The mill, it will be recalled, was sold to the Lima Strawboard Company at sheriff's sale. The company is known as the Crystal Paper Company, the president of which is J. H. Van Dyke, manager of the Standard Oil Works at Lima. The paid up capital stock is $60,000.

News is wafted up the valley that the bondholders and creditors of the Friend & Forgy Paper Company will likely hold a meeting soon to discuss the prospects of a settlement of the company's affairs. The failure took place over a year ago, and as little headway has been gained some dissatisfaction is said to exist.

C. H. Harding, identified with paper making interests at Franklin, is in Springfield, Mass., on a business trip.

Ben Graham, of the Graham Paper Company, St. Louis, called on the trade the past week.

"Colonel" Berry, of Carter, Rice & Co., was seen on the streets here the past week, but he did not tarry long.

Work at the Friend & Forgy plant was resumed this week after a brief shut down, caused by low water and a lack of stock.

Machinery is being placed in position in the building formerly used as a rag house, and located north of Harding Paper Company's mill, for the purpose of manufacturing envelopes.

A Marshall engine has been added to the Harding Paper Company's mill and the capacity of the plant has been increased materially.

Accountant John Whitmore is introducing a system of report blanks at the Franklin Mill by which he expects to learn the amount of stock, time and labor required to make a pound of paper, and thus run the mill for any specified time.

Henry Meeker, of Franklin, has been writing insurance on the different mills of the George N. Friend Paper Company at West Carrollton and Miamisburg.

Henry Jansen had two fingers of his right hand caught between the calender rolls and fearfully crushed the other day at the Franklin Mills at Hamilton.

The Perrine Paper Company at Franklin has received a substantial improvement in the erection of a new machine building. The new structure has been built around and over the old one, and in this manner little time was lost by the force during its construction.

Without a doubt the Haldeman Paper Company deserves considerable praise for its promptness in overcoming obstacles, and for its undiscouraged spirit shown in the midst of ill-fortune and adversity. Work in the lately demolished mill at Lockland has so far advanced that the president announces that they will make paper within three weeks from to day. A loss of $35,000 was sustained. Crowning this intelligence comes news to the effect that the same company will rebuild its plant recently burned at Rockdale. The same location has been selected. Phœnix-like these structures will stand as ample evidence of thrift and prosperity.

Many of the Miami Valley paper manufacturers are in receipt of the circular letters sent out by Colonel Frambach advocating the closing of mills for a certain period. The plan has received the attention of the trade for several weeks, but at present is far from consummation. The consensus of opinion among Dayton manufacturers is that concerted action would result to the advantage of all concerned, inasmuch as the production would be curtailed. However, the local trade considers that suspensions here have been of unusual severity. Chas. D. Mead and J. Howard Friend would be active representatives of the proposed confederation in this State. M. V.

FOX RIVER VALLEY.

[FROM OUR REGULAR CORRESPONDENT.]

APPLETON, Wis., July 31, 1894.

The trade situation generally is nothing to brag of in this valley. If anything it is quieter than it was early in the month. Some of the big producers have more machinery in operation than they can find orders to keep busy and are running on somewhat shorter time than usual. The Globe Mill of the Kimberly & Clark Company at Neenah was shut down to-day until business gets better. One machine at the Tioga Mill of the same company in this city has been down since the middle of last week. The Ravine Mill of the Fox River Paper Company is not running, and has not been in operation for nearly a year. The Lincoln and Fox River mills of this company are running.

The ravages of terrible forest fires throughout the lumber district of the State

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toward the north, caused by the extremely dry weather, were checked by torrents ot rain which fell yesterday. Phillips, a town of several thousand inhabitants, was completely wiped out last week, and Mayor Peter Thom has issued a proclamation to the citizens of Appleton asking them to contribute liberally to their aid. The Van Nortwick Company had 7,000 cords of pulp wood in the burning district which was in great danger for a time, but was saved by hard work.

The fact that the only Wisconsin paper makers who attended the meeting of the American Paper Manufacturers' Association at Saratoga, Colonel Frambach and W. C. Hamilton, had offices conferred upon them may induce a larger attendance from the West next year. Wisconsin is convinced, however, that it was not locality but sterling merit which got them their honors.

Paper men do not need to be told how sharply the search for valuables is prosecuted by the sorters in the lofts of the mills. The finding of small coins, articles of jewelry, &c., is very common, and hardly a week passes that every sorter does not pick up something in this way. Occasionally the finds are larger. One day last week a girl in the mill of the Patten Paper Company in this city found $60 in gold coin in an old vest. It was not long ago that another found $30 in bills, forming the nucleus of a bale of carpet rags. The bale was probably a secret savings bank and had been sold to the ragman without the knowledge of the depositor. A few years ago a young man employed in one of the rag rooms found a roll of bills containing about $300, and it came at a most fortunate time, as the finder had recently married and purchased a home upon which the last payment of $150 was coming due without means of being met. This was the largest find in the history of the business in this valley.

The Van Nortwick pulp mill, which has been closed for several months, was started up again this week.

The wood room of the sulphite department of the mill of the Combined Locks Paper Company was started up last week, and the digesters will probably be given their initial trial this week.

News was received here last week that Maj. G. N. Richmond, now of Tacoma, had sustained a stroke of paralysis and was in a very critical condition. Major Richmond was one of the earliest pioneers in the paper business in Wisconsin, the firm of Richmond Brothers engaging in the manufacture of straw paper in Appleton in the fifties. Major Richmond was several times mayor of Appleton and was a most well-known figure.

All of the Neenah paper manufacturers and their families, and a sizable delegation from other towns, went to Oshkosh last Saturday to witness the regatta between the boats of the Nodaway Boat Club. The course was laid 3 miles to leeward and return, and the race was sailed in a thunder storm and a gale of wind. E. C. Gillette, of the Chicago Paper Company, was one of the crew in James Kimberly's boat, and E. Kimbark, of the J. W. Butler Paper Company, of Chicago, sailed with W. Z. Stuart. These men seemed to be Jonahs, as Kimberly fouled the stake boat and was disqualified, and Stuart did not finish at all. The Nodawayists will know better next time. The race was won by John Kimberly, Jr.

The board of arbitrators who have been reviewing the evidence in the disputed wing dam case between the Atlas and Fox River Paper companies made their report yesterday. The matter was virtually left to T. W. Orbison to establish a gauge.

Another raft of 4,500 cords of pulp wood arrived off the docks at Long Tail Point last Friday, and the work of loading it on the cars was commenced yesterday. Still another raft of 5,000 cords is expected within ten days. A party of about thirty Green Bay gentlemen made a trip to the Point last week to witness the operation of loading the cars. Thirty cars a day are now being sent out. The railroad company has given the place the name of Cress.

While unloading wood from a wagon last week John Boderman, an employee of the Thilmany Pulp and Paper Mills, injured his hand so severely that two fingers had to be amputated.

Frank Perry, of Sault Ste. Marie, is in town.

A. Aldrich, of the Beloit Iron Works, is visiting this valley.

E. E. McCord, of Chicago, was in town last week.

J. C. Armstrong and E. B. Mendsen, of Chicago, are in the city. FOX RIVER.

HOLYOKE.

[FROM OUR REGULAR CORRESPONDENT.]

HOLYOKE, Mass., Aug. 2, 1894.

As compared with the weeks which have passed, the present one shows no indications of improvement. No one expects any change in prices, but there are those who would rejoice and be exceedingly glad if business would pick up. Some have become so case hardened that they have ceased to complain about the times and are turning their attention to something else.

The volume of business does not increase and orders are limited in number and in size. Even medium sized orders are much sought in these days, and anyone who has a ton to buy is looked on as friend indeed. This hand to mouth business is very unsatisfactory, to say the least, and manufacturers cannot be blamed much if they do indulge in a growl now and then.

The stock market keeps pace with the consumption of paper. Sales are small and prices are low. Foreign rags are a drug in the market and domestics are not much better off. There is very little buying aside from immediate needs. Prices were never lower than they are to-day, but manufacturers are not disposed to buy for future use. Chemicals are not in demand, although prices rule very low.

The water in the river has not been as low for several years as it is now. The restrictions are being rigidly enforced by the Water Power Company and no manufacturer can use any surplus water as long as the present rules are in force. Some mills have been troubled by the drought, but it is not noticed as much as it would be if business was good and it was necessary to push the machinery.

The Fall Mountain Paper Company, at Bellows Falls, Vt., has had men employed in the woods for some time cutting logs to be used for sulphite fibre, and it is expected that 8,000,000 feet of timber will be floated down the river within a short time. This is usually an expensive piece of work, and as the water is low this will add to the expense.

Ernest P. Cox, whose serious illness was mentioned last week, died on Saturday and his funeral took place on Tuesday. He was a young man of more than average ability and had a wide circle of friends. His relatives all reside in England, where he was born. The funeral was attended by many friends, and several societies of which he was a member were represented. The floral offerings were numerous and very beautiful. The interment was at Forestdale Cemetery.

The Beebe & Holbrook Company is making some improvements, which will include the putting in of some new machinery and a few minor changes.

William Whiting has just been elected a director of the Western Massachusetts Mutual Fire Insurance Company, of Springfield. Mr. Whiting returned from a business trip to New York a few days ago.

A local manufacturer, who is quite a joker in his way, has a hatchet hung up on the wall of his office, near to his desk, and when any one calls on him and tells what he considers a big story, he quietly points to his hatchet and smiles on his visitor. The latter usually takes in the situation, and when he visits Mr. N—— again he confines himself to facts.

Editor Dwight, of the *Transcript*, announced this week that as soon as the necessary arrangements can be made his newspaper will be issued as an eight page publication. It is now a blanket sheet. It will have six columns to a page and will be stereotyped. A new Goss perfecting press is being put in to do the work. The *Transcript* has been issued twelve years as a daily paper, and is a paying piece of property.

Jacob Frederich, a foreman at the National Blank Book Works, will sail this week for Germany. It is twenty-five years since he visited his native land.

The Griffith, Axtell & Cady Company has just issued a very handsome illustrated catalogue of its fine embossing work. H.

BOSTON.

[FROM OUR REGULAR CORRESPONDENT.]

EASTERN OFFICE PAPER TRADE JOURNAL,
67 FEDERAL STREET,
BOSTON, August 2, 1894.

Now that the summer season is nearing its end some little speculation concerning the fall trade is being entertained.

The general opinion is, so far as the local trade is concerned, that the paper business will show considerable improvement ere many weeks. The improvement looked for is in the line of increased demand, not in advanced prices.

Even now city jobbers report a little improvement in trade as compared with June or July business of last year.

Importers of paper stock report more inquiry for rags, &c., and say that the outlook is beginning to brighten a little.

The sale of the Fairchild Paper Company's mill property at East Pepperell has been consummated. The mills, business and good will pass to the Nashua River Paper Company, of which George T. Keyes is president, and Charles M. Gage vice-president. Mr. Gage is the present head of the Champion Card and Glazed Paper Company, of East Pepperell, while Mr. Keyes has been treasurer of the Fairchild Paper Company. The new company took possession of the plant on August 1 and has started up the upper mill and hopes to have the lower mill running in two weeks. The mills have five Fourdrinier machines with a producing capacity of thirty tons a day, book paper.

The aim of the new company is to make a high grade of book paper, and its product will ere long find its way into the market. H. C. Thurston, for a long number of years connected with the Fairchild Paper Company, and for many years its superintendent, although not with the company during a few years past, has been secured as superintendent for the mills.

The business of the Nashua River Paper Company will be transacted at the mill office in Pepperell, no Boston office being maintained.

Colonel Fairchild, having, through the sale of his company, retired from the paper business, will shortly go to Europe for recreation, and the Boston office of the Fairchild Paper Company will soon be discontinued.

The Bangor Pulp and Paper Company has removed its city office from State street to the John Hancock Building, No. 35 Federal street, Room 417.

Charles E. Perry & Co., paper cutters to the trade, have fitted up their Congress street office quite elaborately. Mr. Perry has a very artistic taste, which shows for itself in the decorative treatment of his private office. From the papered ceiling to the carpet on the floor, the draperies and the furnishings, everything is in perfect harmony of design and color, while the numerous pictures on the walls are reproductions of some of the prize paintings from the salons of Paris. Mr. Perry is fully conversant with every picture and delights to tell of their history, for each points a moral.

Charles Young, Carter, Rice & Co.'s right bower, will leave town on Saturday for Cottage City, where he will spend the customary two weeks. Charlie will be accompanied by his wife, his mother, his sister and her husband and his brother George—quite a family party for him to look after.

Rose Cousins, one of Carter, Rice & Co.'s fascinating stenographers, will start on her summer vacation next Saturday, bound for North Conway, N. H., for two weeks.

Wm. M. Jordan, son of Col. J. P. Jordan, now in town, will return to Philadelphia by the end of the week. William is the Philadelphia representative of Pulsifer, Jordan & Co., and recently returned from Georgeville, P. Q., where he and his father spent the month of July—their summer outing.

Mr. Jordan must reach the Quaker City in time to join the Naval Battalion, which will sail from that port next Monday, for William is one of the naval militia.

E. L. Merrill, who represents Pulsifer, Jordan & Co. in Minneapolis, is visiting Boston with his wife, but expects to return West the end of this week.

Charles S. Barton, president of the Rice, Barton & Fales Machine and Iron Company, was seen in town yesterday. Mr. Barton says that he is building two paper machines just now, one for the George W. Wheelwright Paper Company's mill at Fitchburg, and one for the Beebe & Holbrook Company, Holyoke.

Charles R. Milliken, of Portland, Me., was in Boston yesterday. Mr. Milliken states that two machines of his new mill—the Poland, Mechanic Falls—were started up this week and that a third machine will be started in a few days.

Mr. Comins, manager of the Aerophor Paper Dampener Company, was in town today, his first visit to Boston for several weeks, he having only just returned from a trip to California, and was hung up out West for some days by the Debs strike.

Other recent trade visitors were Stanton Day, of Solon, Me.; ex-Governor Cheney, Manchester, N. H.; A. W. Fitzpatrick, of New Haven, Conn.; H. R. Coffin, of Windsor Locks, Conn.; W. Robertson, of Putney, Vt.; Fred Temple and C. M. Gage, of East Pepperell, Mass.; Geo. K. Baird, of Lee, Mass.; H. A. Emerson, of West Henniker, N. H.; Mr. Williams, of Worcester, Mass.; C. H. Southworth, of South Hadley Falls, Mass.; Charles S. Mayo, of Lawrence, Mass.; Mr. Raybold, of Mittineaque, Mass.; John A. Manning, of Troy, N. Y.; Jean Freese and Albert F. Fuerst, of New York.

William H. Claflin has returned from Europe, where he has been for several weeks.

I. S. Dillingham has been confined to his home at Auburndale for a week past with an attack of malaria and is not yet able to be out.

C. W. Calkins & Co., printers, No. 52 Purchase street, have failed. No statement of liabilities and assets has yet been made, but it is not a heavy failure.

H. M. Whitney, of the Tileston and Hollingsworth Company, is back from a vacation trip to Moosehead Lake tanned up as handsomely as the fashionable summer shoes.

J. B. Kelley is taking advantage of the dull times to get a little seasonable recreation, and so has located himself for a short time at Harwichport, Mass. Mr. Kelley is mourning the loss of his father, who died last week. Edward Kelley, the deceased, was engaged in the crockery business in this city for many years, retiring from active trade in 1880. He was seventy-seven years of age.

The weather has moderated a little and the days are cooler. Rain is needed very much. DELESDERNIER.

PHILADELPHIA.

[FROM OUR REGULAR CORRESPONDENT.]

PHILADELPHIA, August 2, 1894.

"General Humidity" has beleaguered the city pretty effectually during the past few weeks and the meteorological thermometer has stood at its highest, while the business barometer sank lower and lower. The all 'round depression became too great for me, and I have been spending most of my time at Cape May, where the weather is cool and business is never expected and its loss brings no disappointment. For all the trade they have in hand or in sight, the entire local paper dealing fraternity might as well follow my example, for, as one of the trade remarked to-day, "this is the worst season ever experienced in the trade, and the tendency is downward rather than upward." Perhaps if Congress were to pass the tariff bill, or better still to refuse to pass it and go home, the fall might give a better report—perhaps, but quien sabe? I see that the Government experts, arguing from the analogies of 1878, predict an improvement from now onward; but we have heard lots of prophecies during the past twelve months and are almost persuaded that prophecy is a lost science.

All of the mills in this part of the country, with no exception that I have heard of, are closed down for lack of orders, many

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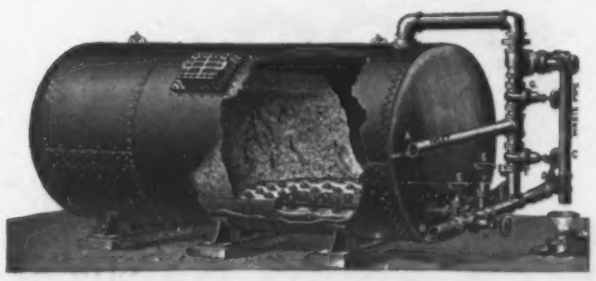
PAPER MILL MACHINERY.



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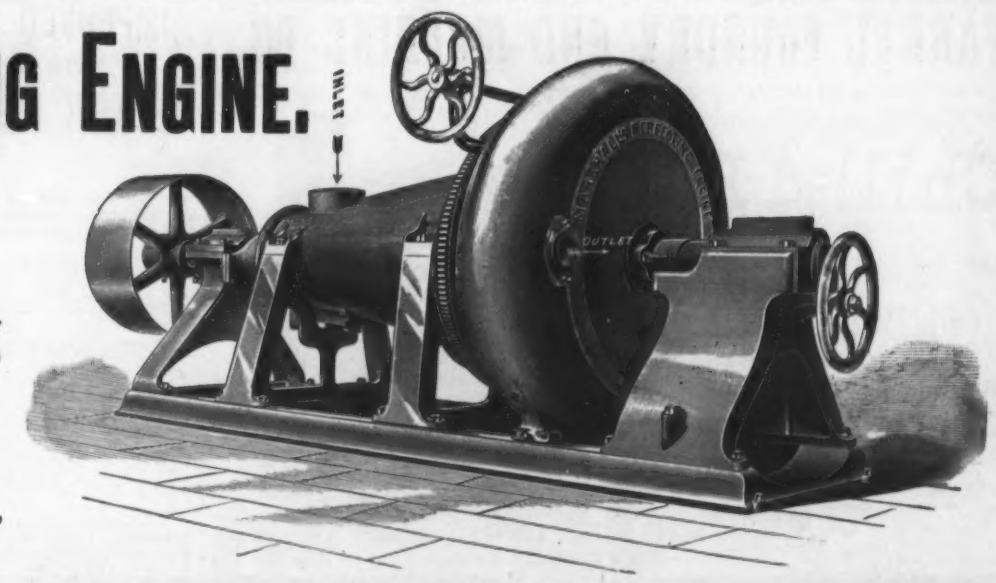

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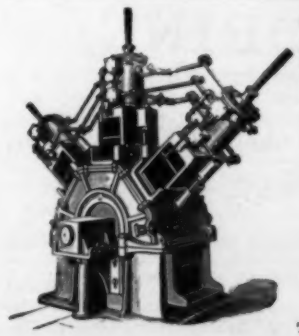

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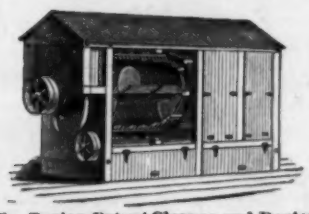

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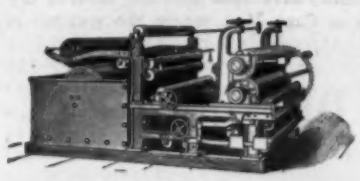

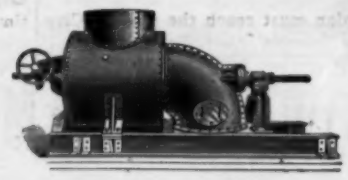

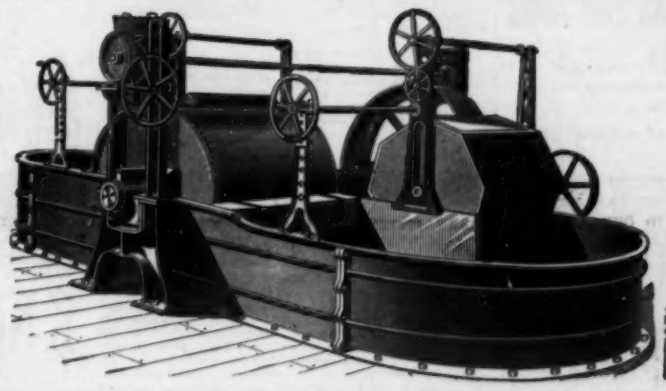

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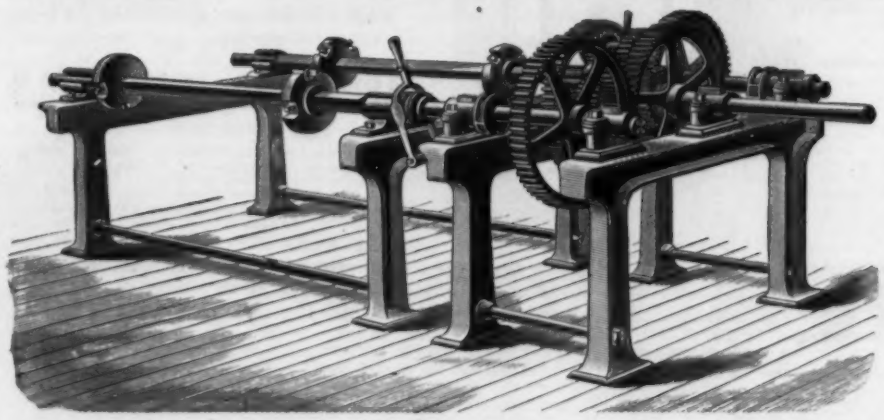

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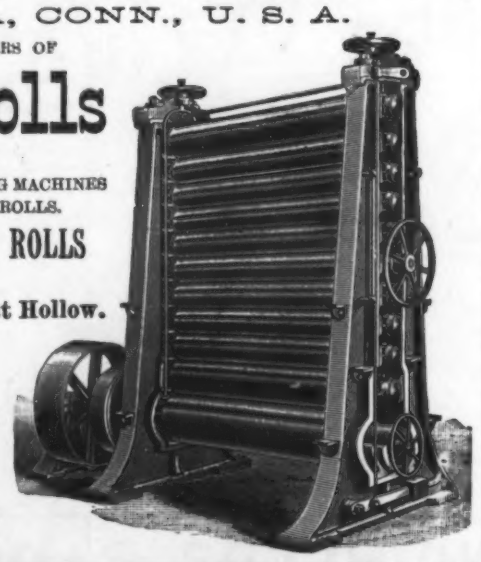

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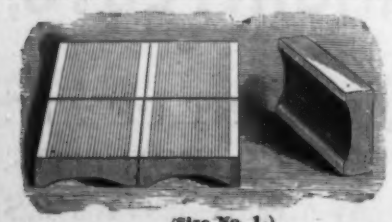

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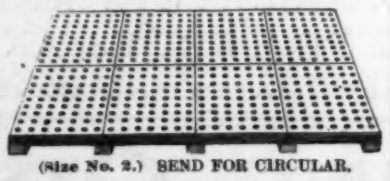

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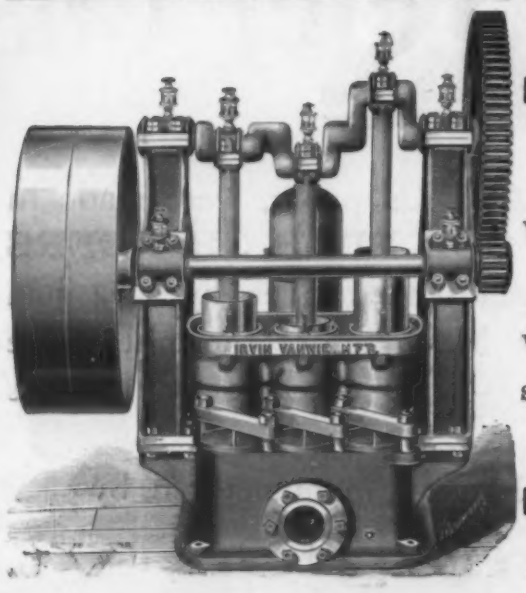

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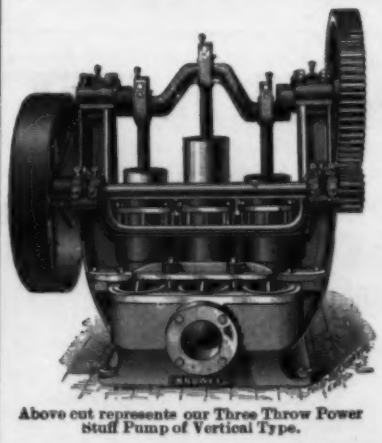

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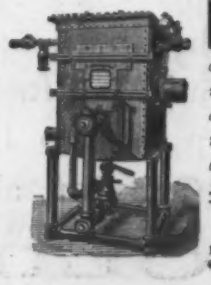

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of them for an indefinite period. The Glen Mills Company's parchmentizing plant, however, is running on the large stock of water leaf made up in the spring, and I am told that the intention is to start the water leaf plant again shortly. The same company also reports a very encouraging business for these first two days of the month following a very dull July. Of course two days' orders do not make a good month any more than one swallow makes a summer; but it is the only cheerful report I got today, and I am glad to chronicle it.

The most important recent news in the paper world was the sale on July 26, under foreclosure proceedings, of the two plants of the American Wood Paper Company, at Spring City and Manayunk. The Spring City property brought $31,000, and that at Manayunk $20,000, both clear. The purchaser is said to be J. D. Wing, of Wing & Evans, one of the largest creditors of the defunct concern. It will be remembered that Mr. Wing devoted a great deal of time and energy to an attempt to reorganize the concern last year, but that all his plans appeared to fail. Now, simultaneously with this sale and purchase, I notice the organization of the Schuylkill Paper Company, with Alfred S. Miller, assignee of the broken company, and Chas. S. Peterson, of Hollingsworth & Peterson, Philadelphia representatives of Wing & Evans, among the incorporators. Putting these facts together, I argue that Mr. Wing's schemes are all right after all, and that one or both of the plants will be put into shape and operated hereafter in a business-like manner. I hope that my surmise is correct, for it would argue Mr. Wing's faith in the future of the busines, and his opinion, especially if backed by his money, is worth considering.

A recent suit of the Segal Paper Manufacturing Company against Adolph Segal, whereby the former endeavored to enjoin the latter from using or permitting the use of a patent paper wax coating machine, has been decided against the company. The latter, it seems, claimed that when it bought Mr. Segal's plant it bought also the exclusive right to the process; but the court did not so decide.

Quite a number of the local trade are spending a portion of the dull season at the various summer resorts. S. A. Rudolph, whom I pass from time to time on the board walk at Cape May, is looking hale and hearty in spite of the frequent long, tiresome and dusty trips he makes to this city. He has summered at the Cape regularly during the past twenty years. Geo. Reed, of the Nescochague Paper Company, I meet now and then on the train coming from Ocean City, where he spends most of his summer Saturdays and Sundays. Samuel Magarge, of Magarge & Green, has a cottage at Atlantic City, where he spends all his spare time.

Those of the trade who know him will regret to learn that W. F. Kilhour, assistant bookkeeper for A. G. Elliot & Co., has been lying dangerously ill with typhoid fever during the past ten days. I am glad to say, however, that he is believed to have passed the critical stage and to be convalescent.

Visitors have been rather few of late, the Eastern mills in particular seeming to be tired of sending travelers after trade which does not exist. Among those here during the past fortnight were: F. L. Hayward, assistant secretary of the Linden Paper Company, Holyoke, who came from Boston by sea, via Baltimore; George Barden, from the L. L. Brown Paper Company, Adams, Mass.; George Knowlton, Sr., of Knowlton Brothers, and the Ontario Paper Company, Watertown, N. Y.; D. C. Dudley Smith, of the Susquehanna Water Power and Paper Company, Conowingo, Md.; Chas. E. Callender, Glendale, Mass., and Geo. E. Craft, of the Geo. C. Gill Paper Company, Holyoke. Sidney A. Morley, of the Watertown Paper Company, has been spending his vacation in Philadelphia, I am told, and his genial countenance may be recognized nearly any evening at the Bingham House. Other visitors were Samuel Egolf, of the Columbian Paper Company, Buena Vista, Va.; James Symington, Lancaster, Pa.; J. H. Beckley, Beckleysville, Md.; Mr. Brest, Anchor Mills Paper Company, Windsor Locks, Conn., and Edward Macready, of the Catawissa, Pa., Fibre Company.

I have gathered a rather goodly list after all, but it covers several weeks.

Wm. George, chief of city salesmen of the I. N. Megargee Paper Company, pitched base ball in a match between a nine of the Megargee house and a nine from the Nescochague Company at Gloucester last Saturday a week. His curves were so skillful and his delivery of the "twirling sphere" so "hot" that he came near ending the earthly career of a small boy, who was knocked out in one round.

Paper men all over town are asking one another "Who, or what is the 'Rosemont Paper Company?'"

The market for chemicals continues to show declining prices. The Alkali Company has dropped an eighth of a cent per pound on bleach for August shipments, making the price on 25 ton lots 1¼ cents. The users of bleach in this country who have made a determined stand against the extortion of this monopoly can congratulate themselves on the success of their efforts. The Alkali Company's sales have been materially diminished, and it has been compelled, through carrying large stocks, to make reductions in price in the hope of disposing of its surplus. Soda ash and alkali continue very quiet at 1⅛ cents for 48 per cent. caustic, and 1 cent for 58 per cent. alkali. STYLOGRAPHIC PEN.

Business Tact of an Engineer.

I heard of a locomotive driver the other day, says a writer in *Dixie*, who is playing a trick upon the road employing him that is worthy of imitation by many a stationary engineer. Being an observing fellow he noticed that the empty oil barrels, to use an Hibernianism, were not empty. So before they were sent away he managed to get them around in the neighborhood of his engine and by blowing steam through them succeeded in collecting quite a quantity of oil. In fact, he gathered so much that for several months no oil was charged against his engine.

This naturally appeared on the performance sheet, and the master mechanic accused the storekeeper of neglecting to keep his accounts accurately. The storekeeper protested and investigation followed to find out how this crack driver succeeded in stealing oil and why he should stoop to such a thing. But when he was seen to be taking it from empty barrels nothing was done except that at the other end of the line all of the empty barrels were steamed, with the result of securing enough oil for all the bolt cutters and shop shafting. I do not know that the pay of that driver has been raised—in fact I think not; but it is safe to say that when any laying off is to be done the lightning will not strike him, and that when there is any promoting to be done his chances are not what would be called meagre.

A statement recently issued from the Comptroller's office at Albany, N.Y., shows that the number of New York corporations on the books for taxation has increased since January 1 from 2,513 to 5,944. The sworn statements of the old corporations exhibited an average decrease of 27 per cent. in the value of the capital stock as compared with last year.

Laws of Running Belts.

[WRITTEN FOR THE PAPER TRADE JOURNAL.]

By SANFORD E. THOMPSON.

In this article I do not intend to go into the theory of running belts, but rather to view the subject from a practical standpoint, stating a few common cases and the reasons for the behavior of the belt in each case. The data used are in general taken from observations of running belts. As in practice, however, so many things enter into the action of a belt on pulleys that two belts under apparently the same conditions will sometimes run toward opposite edges of their pulleys. I have made a series of experiments on a small scale to verify my conclusions. For my experiments I attached a small crown faced pulley to a machine, so rigged that it could be run at any rate of speed up to 2,000 revolutions per minute. At a distance from this I fastened in such a way that it could be readily moved in any direction a frame for a pulley, and to fit this frame I had three pulleys—one of the same size as the driving pulley, another a little over half, and a third not quite twice its diameter. I also had a second frame made for a straight faced pulley which I could press against the belt as an idler.

A rule much abused in a mill and one which I have seen stated in books on mechanics is that a belt will run toward the high side of a pulley. While this is true under certain conditions it cannot be applied to cases where the shafts are out of line or where the belt is stretched out of shape. In place of this rule I wish to substitute two others, which will cover nearly every case of open belt.

First: Where a belt runs over straight faced pulleys the pulleys may be considered as rollers, and the belt will follow similar laws of motion to those which a solid body would follow in running over these rollers. The effect of crowning the face may in part counteract this action, but ordinarily the crown may be disregarded. It must always be borne in mind, however, that the strand of the belt running toward a pulley governs the action of the belt on this pulley, and therefore the portion of the belt running toward the pulley must be considered as the solid body.

Secondly: If one edge of a belt on pulleys with parallel shafts is stretched more than the other edge it will tend to run toward the stretched edge.

If these two laws both act at the same time and in opposite directions the belt will follow the stronger tendency.

Let us now consider a number of special cases to which these laws may be applied and which I have illustrated with sketches. The sketches are all in plan, and by the under side of the pulley is meant the half which is out of sight; the upper side, the half which is actually shown.

Suppose first that the two shafts are in the same plane, but out of line with each other.

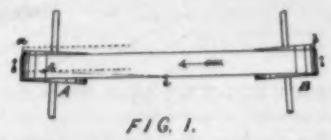


FIG. 1.

In Figure 1 is shown the belt before starting the speed. If now the belt is started in the direction shown by the large arrow, the pulley A will act as a roller to throw the belt toward its edge, *a*, while the lower strand of the belt passing toward the under side of the pulley B, the latter also acts as a roller and tends to throw the belt toward *b*. Consider, for example, any point, *c*, on the edge of the belt. The force transmitted by its friction on the pulley A, tends to make it move in the direction *cd*, and to make the belt take the new position shown by dotted lines.

Next, we will suppose that the pulleys and shafts are in line, but that the belt is stretched out of shape so that one edge is longer than the other. The belt will take

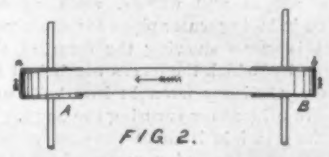


FIG 2.

the position shown in Fig. 2, and the belt running in the direction of the large arrow, the shaft will be at an oblique angle to the centre line of the belt, and the upper side of the pulley A will act as a roller, tending to throw the belt toward *a*. The under side of the pulley B, toward which the lower strand of the belt runs, will also act as a roller and tend to throw the belt in the same direction.

If the shafts are in parallel planes, but not in the same plane, that is, if the end of one of them is high, as shown in Fig. 3, and the belt is running in the direction of the large arrow, the belt will move toward the

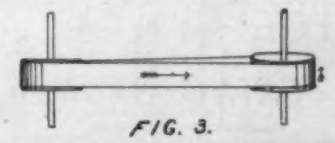


FIG. 3.

edge of the pulley as indicated by the small arrow. Here the pulley acts as a roller in a similar manner to that shown in Fig. 1, except that in the latter we consider the upper half of the pulley as guiding the belt, and in Fig. 3 we consider the portion of the pulley lying to the right of the shaft as guiding it. In other words the roller in Fig. 1 is in a plane at right angles to the roller in Fig. 3.

Let us now turn to the most common case of all, that of a belt running on a crown face pulley. Practically a crown face pulley consists of two cone pulleys, and for convenience of demonstration we will first consider two cone pulleys on parallel shafts which are in line, the slope of the cones being in the same direction.

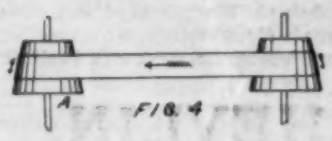


FIG. 4

FIG. 5.

We know that the belt in Fig. 4 will run in the direction of the small arrows, and we wish to know the reason for it. If we consider the pulley as a roller we should at first glance say that the belt would run down the cone, but here the pulley does not act as an oblique roller, for the axis, in the case of a cone pulley, is at right angles to the direction of the belt. If we take about one-half the face or surface of the pulley A (Fig. 4) and develop it, that is, spread it out flat with the belt upon it, we will have a surface like that shown in Fig. 5, where the belt is represented by *c d e f*. It will be seen that the edge of the belt *c d* nearest the smaller end of the cone is much shorter than the other edge and the extra stretch or tension on the edge *e f* tends to straighten out the belt and throw it in the direction of the small arrow or toward the large end of the cone.

As stated above, a crown faced pulley practically consists of two cone pulleys with their large ends together. Suppose that we run a belt onto the edge of a crown faced pulley; it will run up the cone shaped surface toward the centre and a little past it, when the cone surface on the other side will throw it back again; the first surface will re-act upon it, and it will finally reach equilibrium in the centre.

A crossed belt will run true on the pulleys if the pulleys are of the same size. When one is much smaller than the other it will run toward one edge of the smaller pulley, and the way the belt is crossed will determine toward which edge it will run. In considering this I always think of the strand running away from the smaller pulley as a foreign body which presses against the strand running toward the pulley, and tends to throw it off. If we wish to throw a belt off a pulley we always place the stick or shipper against the strand running toward the nearest pulley, as it will have very little effect on the other strand. For a like reason, as the cross is nearer the smaller pulley, the strand running toward the small pulley is acted on by the strand running away from it more easily than the latter is influenced by the former.

Where a crossed belt runs onto a small pulley of a machine the machine may sometimes be set up with the shafts slightly out of line to allow for the tendency of the belt to run off. If this is done care must be taken to always cross the belt in the same way, for otherwise the tendency of the belt to run off will increase the effect produced by twisting the machine instead of counterbalancing it.

Where an idler is used it may be adjusted to suit the belt by moving one end of it in a direction parallel to the direction of the belt, remembering that it acts merely as a roller. When it cannot be moved in this direction, but has to be raised or lowered at right angles to the belt, if the idler is on the top strand of the belt the end toward which it is desired to run the belt must be raised. If this does not produce the desired result it shows that the idler shaft is out of line and causes the idler to act as an oblique roller, which overcomes the pressure against the belt. Raising and lowering one end of an idler to guide a belt is very bad practice, and idlers should always be built so that they can be adjusted in a line approximately parallel to the belt.

The Electric Arc Light.

One advantage which electric arc lights have on several occasions been pointed out to possess over all other means of illumination is that that they give off a very large proportion of chemical rays and accordingly closely simulate the effects of sunlight. Dark rooms, cellars and other places into which sunlight does not come, and which are usually unhealthful, may therefore be expected to become quite as desirable from a purely sanitary point of view, and to be as easily protected from foulness when arc lights are used in them as rooms to which sunlight has free access. In dark stores and other establishments the introduction of arc lights ought, consequently, to have a decidedly beneficial effect upon the health of employees, and should relieve them to a considerable extent from the attacks of diseases produced by want of sunlight. A practical demonstration of this power of the arc light can readily be obtained by remaining for a short time in close proximity to a large light, when it will be found that all the effects of sunburn will be produced.—*Cassier's Magazine.*

In punching a belt for lacing, it is desirable to use an oval punch. The large diameter of the punch should be paralled with the belt, so as to cut out as little of the effective section of the leather as possible.

The Non-Antem Sulphite Digester Co.

310 TEMPLE COURT BUILDING, NEW YORK,

BUILDERS OF

E. MEURER'S

Patent Sulphite Pulp Digester.

THE HUDSON RIVER WATER POWER AND PAPER CO.,

HARTFORD, Conn., June 4, 1894.

THE NON-ANTEM SULPHITE DIGESTER CO.,
310 Temple Court, New York City:

Gentlemen—Previous to purchasing a Sulphite Digester with your lining our superintendent, Mr. Duncan, and myself had looked into a good many kinds of linings for Digesters, and after a very careful and thorough inquiry and investigation we decided that it would be for the best interests of our company to adopt your lining for the large Digester for which we have just contracted.

Yours truly,

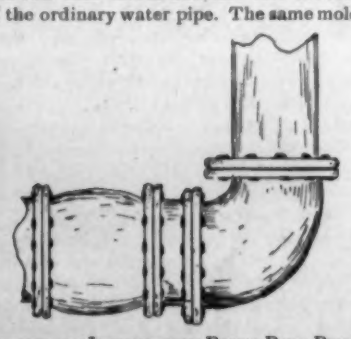
THOMAS DUNCAN, Treasurer.

New Inventions—XLVI.

[WRITTEN FOR THE PAPER TRADE JOURNAL.]

BY GEO. DAMON RICE.

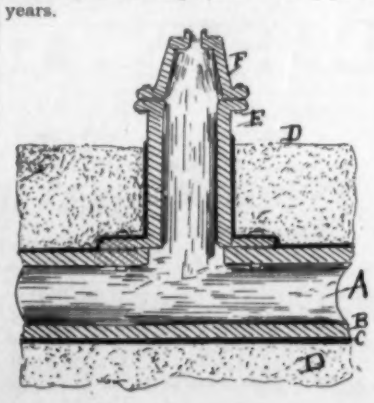
Experiments with the new paper pulp pipes, which are made on pretty much the same principle as the fibre pail, have demonstrated that the idea will eventually prove successful. As it stands now, the hand-made pipes, formed from crudely worked and irregularly subdued pulp, are not very attractive in appearance, nor well enough made to warrant that they will stand the wear and tear to which street water pipes are subjected. However, it would be more of a wonder if the plan of making water pipes from pulp should turn out a booming success at the start. Time and experiments are essential to the development of all new things. With each new test of the proposed pipes a step in advance is made, and this would seem to indicate that after a few more trials perfection will have been attained. The matter as it stands now is about as follows: Paper pulp, in which there is a fairly good fibre, is agitated with water and run into molds and cast into the form of the ordinary water pipe. The same molds



METHOD OF JOINTING THE PAPER PULP PIPES.

used in connection with casting iron pipes are employed. The mode of procedure is substantially the same. Of course there are various strengthening materials compounded with the pulp, otherwise it would not stand a great pressure. The inventors report that these ingredients are inexpensive and simple. A tar compound is one of the substances.

The paper pulp material can be readily cast into all shapes necessary for making turns, angles and unions, such as are needed in laying water pipes for street use. A cut is given showing the form of the flanges by which the pieces are bolted together. Ordinary wrought iron bolts and nuts are utilized for securing the parts. In fact the principle is about the same as connecting any kind of a metal pipe. If a paper pulp pipe were to be placed in the ground and exposed to the action of the earth, decay would follow in a year or two. Therefore the paper substance is coated with a cement compound in which there is a percentage of cowhair and asphalt. This mixture is applied to the surface of the pipes and joints in a heated liquid state and before the pipes are laid. The coating is half an inch thick and preserves the pipe for years.



SECTION OF PAPER PULP PIPE UNDERGROUND.

A section of the pipe as it appears underground is represented. The interior of the pipe is marked A, the cut-off part showing half the pipe being designated by B. The cement coating is indicated by the dark lines C; this coating covers all of the exposed surfaces of the pipes. The earth is signified by the letter D. That part of the angle of the pipe which protrudes above ground is marked E. For fire hydrant and other uses there may be an attachment with gauges, &c., at the part F. The upright piece is bolted to the other as shown.

Precisely what the use of making pipes from paper pulp is, when iron seems to do the work all right, may be a mystery to some. Those interested in the scheme have plenty of reasons, however. Perhaps it might be well to mention one or two of the most likely. Iron pipes conduct electrical currents through the ground at times when not wanted. Paper pipes are non-conductors. Iron pipes rust and decay; paper pipes do not rust. Exactly the strain which a common iron water pipe will stand is not known by the writer. The paper pipes stand 200 pounds per square inch. Iron pipes are heavy and freightage is high. Paper pipes are light.

The most important point in these days is the cost. It is stated that paper pipes of the same calibre as iron can be laid at a cost 15 per cent. less than the metal ones. The durability question is unknown, as these particular pipes have not been tried long enough to prove anything as to their lasting powers. The inventors claim that the pipes will last longer than iron—but what inventor will not claim that his invention will outdo and outlast any other?

Dr. Stuart Eldridge, of the Imperial Board of Health, Tokio, and Health Officer of the Port of Yokohama, under date of June 18, writes to the Supervising Surgeon-General, Marine Hospital Service, giving details of the existence of the genuine Bubonic plague in China, and closes his report as follows: "Singapore has put in force quarantine regulations against Hongkong, similar to those of Japan, Manilla, a quarantine of fourteen days. If I may presume to advise, I would say that the most stringent measures may need to be taken to protect the United States, particularly as regards certain classes of goods from China likely to convey infection, *e. g.*, rags, old cotton, &c., and also such manufactured articles as are made in the little native workshops, with perhaps a case of plague dying in the same room; such things are straw matting, embroideries, and every sort of textile fabric."

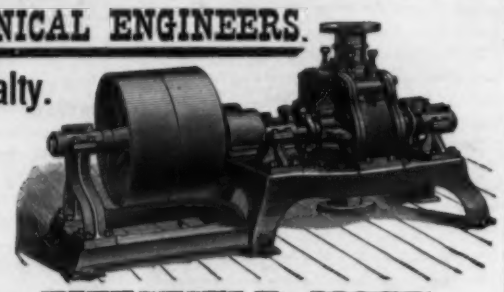
An improved dandy roll, the invention of two Englishmen, M. Foster, of Joppa, and W. Morrison, of Leith, England, consists in fitting on to the paper machine adjustable spring bearings to hold the ends of the dandy roll in position. At each side of the machine is fitted a bracket, having a fork at its upper end, in which the spring bearings are placed. The arrangement is such that the weight of the dandy roll is supported by the spring bearings, and the pressure of the pulp can be regulated by merely raising or lowering the bearings by means of joint nuts, and altering the tension of the spring cushions. When any hard substance passes through the machine the rolls can rise up and allow the substance to pass without doing damage. The bearings at opposite sides of the machine may be shifted nearer together or farther apart by simply slackening the joint nuts and then pushing them along the forks of the supporting brackets, thus allowing rolls of different lengths to be used to suit the different classes of paper being manufactured.

Wood Pulp, Soda AND Sulphite,
IMPORTED BY
G. RAU, TIMES BUILDING, New York.
SOLE AGENT FOR THE U. S. AND CANADA:
ROZÈS AINÉ & FRÈRES, Agen,
Well-known Packers of Linens and Cottons.

"RUDDER" BRAND
SODA-ASH BLEACHING POWDER SALT-CAKE RUDDER B.T.&C? BRAND CHEMICALS
PURE AMMONIA-SODA ALKALI
AND
HIGH STRENGTH BLEACHING POWDER
ARE THE BEST FOR PAPER MAKERS' USE.
Consignments regularly received at all Ports.
AMERICAN OFFICE: 66 BROAD STREET, NEW YORK.
BOWMAN, THOMPSON & CO., Ltd., NORTHWICH, ENGLAND.

TRADE MARK
AJAX ANTI-ACID METAL,
FOR THE RESISTANCE OF ACIDS AND ALKALIES,
ESPECIALLY ADAPTED FOR
Digesters, Sulphite Machinery, &c., &c. We sell the Metal in INGOTS, furnish CASTINGS, any size as per patterns, and COCKS, VALVES and FITTINGS of every description.
THE AJAX METAL CO., INCORPORATED, PHILADELPHIA, U. S. A.
WE INVITE CORRESPONDENCE.

E. D. JONES & SONS CO.
MILLWRIGHTS AND MECHANICAL ENGINEERS.
Paper Mill Plans a Specialty.



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ALSO MANUFACTURERS OF
Improved Patent Rag Engines, Dusters, Elevators, Etc.
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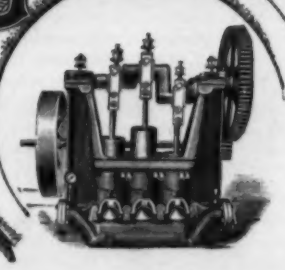
Rotary Pumps and Turbine Water Wheels.
SHAFTING, PULLEYS, HANGERS AND GEARING.

GOULDS PUMPS Are Better
FOR PAPER MACHINES.



Goulds Triplex Suction Pump
Ensures perfect suction on boxes; lessens consumption of steam for drying; returns water from suction boxes to division boxes; reduces percentage of "broke" paper; improves the quality of paper produced, makes greater speed, and therefore greater production possible. Indispensable to the progressive Mill man. Send for new Mill Catalogue with numerous applications.
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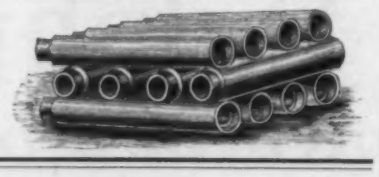
Manufacturers of PUMPS and HYDRAULIC MACHINERY.
Works & Main Offices: Seneca Falls, N. Y., U. S. A. Warerooms: 16 Murray St., New York City.
Or Nearest Branch Agency—THE GOULD CO., 22 and 24 North Canal St., Chicago, Ill.
SMITH & WISCHESTER CO., 19 to 27 Woodsell St., Boston, Mass. WOODIS & LITTLE, 212 & 214 Market St., San Francisco, Cal.
S. O NELSON MFG. CO., Eighth & St. Charles Streets, St. Louis, Mo. L. M. YATES, 231 Vine Street, Philadelphia, Pa.

WESTERN NEW YORK MANUFACTURING CO., Tonawanda, N. Y.,

MANUFACTURERS OF
Mineral Asphalt Roofing . .
—FROM—
. . Pure Trinidad Asphalt.
FIREPROOF. PLIABLE AND DURABLE.
—ALSO—
WOODEN WATER PIPE
(WICKOFF PATENT),
Made to stand any test from 20 to 160 lbs. per square inch.



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NO TAR. ROOFING NO TAR.
It is superior to any other Roofing and unequaled for House, Barn, Factory or Outbuildings; it costs half the price of shingles, tin or iron; it is ready for use and easily applied by anyone; it is the best roofing in the market in durability. Send for estimate and state size of roof.
RUBBER PAINT.
The best known Paint in the world for Tin, Iron or Shingle Roofs, Fences, sides of Barns and Outbuildings; it costs only 60 cents per gallon in barrel lots, or $4.50 for a 5-gallon tub. Color, dark red. It will stop leaks in tin or iron roofs that will last for years; it is guaranteed not to peel, crack, scale nor wash off and it's fireproof against sparks. TRY IT.
SHEATHING PAPER.—900 square feet, $3.00; keeps buildings cool in summer, warm in winter.
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CHAS. B. PRIDE, APPLETON, WIS.
Mill Architect and Contractor.
Specialties: PAPER MILLS AND SULPHITE FIBRE MILLS.
Plans Furnished and Mills Constructed on shortest possible notice.

ALUM!
THE MERRIMAC POROUS ALUM is unsurpassed for purity and good results.
All other grades of Alum for paper makers' use and for filtering purposes. Address
MERRIMAC CHEMICAL CO., 13 Pearl Street, Boston.

AMERICAN
STAVE & COOPERAGE CO.,
Manufacturers of Cedar, Cypress, Pine or Oak
Round and Square Tanks
OF ANY SHAPE OR CAPACITY.
OFFICES:
Broad and Beaver Sts., NEW YORK. 160 State St., BOSTON.
Illustrated Catalogue upon application.

Imports and Exports.

IMPORTS AT NEW YORK.

FOR THE WEEK ENDED JULY 27, 1894.

An. Colors..	389	$27,901	Paper.....	1,167	$38,073
Alum.....	22	95	Steel Pens...	4	2,524
Alum's Cake	—	—	Stationery...	5	595
Bl. Powders	686	11,543	Slate Pencils	512	3,006
Soda Ash...	4,102	10,032	Clay.....	—	1,400
Soda, Caus.	735	9,774	J'te B'ts, &c.	—	—
Soda, Sal...	—	—	P. Hangings	2	78
Soda, Hypo.	—	—	P'p'r Stock..	3,585	24,598
Ultramarine	100	3,830	Terra Alba..	—	—
Books.....	402	42,775	Waste.....	—	—
Newspapers.	221	6,751	Wood Pulp..	138	1,157
Engravings.	60	4,040			
Ink.....	21	866			
Lead Pencils	28	5,251	Totals....	12,281	193,790

Imports General Merchandise for the week ended July 27, 1894.....$7,344,698

IMPORTS OF PAPER STOCK AT NEW YORK.

FROM JANUARY 1 TO JULY 31, 1894.

Whence Imported.	*Rags.*	*Old Papers.*	*Chemical Fibre.*	*Ground Wood.*	*Manilla Stock.*
	Bales.	Bales.	Tons.	Tons.	Bales.
Alexandria...	1,249	....	....	....	....
Antwerp.....	857	275	678	.....	9,892
Aspinwall	90	....	....	....	....
Bordeaux.....	684	....	....	....	....
Bremen	672	25	6	....	5,447
Bristol.....	....	....	....	....	3,353
Buenos Ayres.	123	....	...	....	....
Calcutta.....	....	....	....	....	2,797
Cent. America	60	....	....	....	....
Christiania....	....	....	306	....	474
Copenhagen..	253	....	1,197	....	1,869
Dublin.....	....	186	....	....	....
Dundee.....	....	....	....	....	628
Dunedin.....	....	....	....	....	183
Fiume.....	....	....	99	....	....
Geestemunde.	252	....	....	....	1,809
Genoa.....	....	....	...	....	4,350
Glasgow.....	394	77	....	....	243
Gothenburg ..	91	....	107	....	....
Hamburg.....	1,228	230	400	....	3,065
Hamilton.....	....	....	....	....	42
Hiogo.....	9,001	....	....	....	....
Hong Kong...	43	....	....	....	....
Hull.....*a*	2,517	185	920	.....	11,807
Kobe.....	32,226	....	....	....	....
Leghorn.....	1,684	....	....	....	....
Leith.....	....	150	....	....	138
Liverpool.....	1,015	840	....	....	14,803
London.....	3,361	1,434	20	....	8,421
Marseilles....	466	....	....	....	486
Nassau	48	....	....	....	....
Newcastle....	....	79	....	....	3,279
Rio.....	20	....	....	....	..
Rotterdam....	940	119	500	....	8,588
Southampton.	....	....	....	....	100
Stettin.....	2,572	....	696	....	7,481
Trieste.....	....	....	40	....	....

a. Including 347 bales cotton waste.

NEW YORK IMPORTS.

FROM JULY 24 TO JULY 31, 1894.

Paper Stock.

G. Rau, Chateau Lafitte, Bordeaux, 136 bs. rags.
Jessup & Moore Paper Company, Erin Isle, Genoa, 684 bs bagging.
J. Joseph & Brother, by same, 410 bs. bagging.
J. Libmann & Co., State of California, Glasgow, 35 bs. rags.
J. W. Mason & Co., Buffalo, Hull, 400 bs. manillas.
Train, Smith & Co., by same, 92 bs. bagging.
J. W. Mason & Co., Tauric, Liverpool, 166 bs. manillas.
Train, Smith & Co., by same, 96 bs. bagging.
J. W. Mason, Nomadic, Liverpool, 132 bs. manillas.
J. Libmann & Co., by same, 42 bs. rags.
Lewy Brothers, Spain, London, 296 bs. rags.
James Pirnie, by same, 140 bs. bagging.
Castle & Gottheil, Schiedam, Rotterdam, 184 bs. bagging.

Paper.

Julius Stenfeld, Neustria, Marseilles, 9 cs.
E. G. Soltmann, Waesland, Antwerp, 2 cs.
G. W. Sheldon & Co., by same, 23 cs.
L. C. Wagner & Co., by same, 6 cs.
L. De Jonge & Co., by same, 6 cs.
R. F. Downing & Co., by same, 21 cs.
Kupfer Brothers, by same, 25 cs.
Dingelstedt & Co., by same, 6 cs.
American Aristotype Company, by same, 25 cs.
R. Sulsberger, H. H. Meier, Bremen, 21 cs.
R. F. Lang, Trave, Bremen, 2 cs.
Eckmeyer & Co., by same, 9 cs.
A. Davis & Sons, by same, 6 cs.
F. W. Devoe and C. T. Raynolds Co., Britannic, Liverpool, 20 cs.
D. Steinhardt, by same, 7 cs.
W. Heuermann, by same, 16 cs.
C. D. Stone & Co., Othello, Antwerp, 9 cs.
L. De Jonge & Co., Taormina, Hamburg, 37 cs.
G. Gennert, by same, 35 cs.
J. Dickinson & Co., Spain, London, 23 cs.
E. Fougera & Co., La Normandie, Havre, 25 cs.
American Tobacco Company, by same, 20 cs.
Oscar T. Melvin, Friesland, Antwerp, 2 cs.
J. Campbell & Co., by same, 6 cs.
G. Gennert, by same, 6 cs.
Photo Material Company, by same, 29 cs.
The American Aristotype Company, by same, 24 cs.
L. De Jonge & Co., Schiedam, Rotterdam, 9 cs.
H. Schuste & Co., Friesland, Antwerp, 1 cs.
L. C. Wagner, by same, 18 cs.
G. W. Sheldon & Co., by same, 32 cs.
Brown & Palmer, by same, 1 cs.
W. H. S. Lloyd, Chester, London, 2 cs. hangings.

IMPORTS of Rags and other Paper Stock at the Port of New York for the month ended July 31, 1894, from the following named Ports, showing Quantities from each Port.

Whence Imported.	*Rags.*	*Old Papers.*	*Chemical Fibre.*	*Ground Wood*	*Manilla Stock.*
	Bales	Bales	Tons	Tons	Bales
Antwerp	61	16	—	—	678
Bremen.....	—	—	—	—	22
Bristol.....	—	—	—	—	492
Bordeaux.....	136	—	—	—	—
Genoa.....	—	—	—	—	1,094
Glasgow.....	35	—	—	—	—
Gothenburg.....	91	—	15	—	—
Hull.....	197	—	—	—	1,997
Kobe.....	4,941	—	—	—	—
Liverpool	432	—	—	—	1,111
London	340	11	—	—	730
Marseilles.....	390	—	—	—	13
Newcastle.....	—	—	—	—	198
Rotterdam.....	113	90	40	—	1,958
Stettin.....	—	—	100	—	800
Totals.....	6,720	117	164	—	8,363

Special List of Imports of Paper Stock at the Port of New York for the month ended July 31, 1894.

Importers.	*Rags.*	*Old Papers.*	*Chemical Fibre.*	*Ground Wood.*	*Manilla Stock.*
	Bales	Bales	Tons.	Tons.	Bales
Atterbury Brothers.	42	....	....	....	....
Bertuch, F., & Co...	....	....	100	....	....
Burgass & Co.....	....	16	....	....	....
Cabot, Ray & Co....	....	10	....	....	....
Castle & Gottheil ...	61	....	15	....	250
Dutton, H., & Co....	....	....	....	....	198
Flint & Co.....	4,941	....	....	....	....
Helwig, R.....	....	....	39	....	....
Jessup & Moore Paper Co.....	300	....	....	....	684
Joseph, J., & Bro....	....	....	....	....	410
Kugelmann & Co....	....	....	....	....	13
Lewy Brothers.....	289	....	....	....	911
Libmann, J., & Co....	77	....	....	....	....
Mason, J. W., & Co.	....	....	....	....	1,108
Millar, G. W., & Co.	....	....	....	....	282
Oelrichs & Co.....	....	....	....	....	22
Overton, R. H., & Son.....	....	....	....	....	40
Perkins, Goodwin & Co.....	....	....	....	....	408
Pirnie, James.....	809	11	....	....	1,949
Rau, G.....	207	....	10	....	200
Rose, S. F.....	41	....	....	....	....
Stratford, G.....	....	....	....	....	590
Train, Smith & Co...	289	....	....	....	1,294
Totals.....	6,796	117	164	....	8,363

BOSTON IMPORTS.

FROM JULY 26 TO AUGUST 1, 1894, INCLUSIVE.

Paper, &c.

W. A. Nosworthy, British Empire, London, 18 cs. paper.
J. Dickinson & Co., Cephalonia, Liverpool, 15 cs. paper.
Wm. Guild & Co., by same, 5 bs. periodicals.
A. H. Davenport, by same, 1 cs. paper hangings.
Gregory & Brown, by same, 1 cs. paper hangings.
H. A. Turner, by same, 1 cs. paper hangings.
Carter, Rice & Co., Rialto, Antwerp, 9 cs. paper.
Houghton & Dutton, by same, 1 cs. paper.
Order, by same, 2 cs. paper.
Thomas Groom & Co., Borderer, London, 1 cs. writing papers.
American Decorative Company, by same, 1 cs paper hangings.

Paper Stock.

Train, Smith & Co., Rialto, Antwerp, 125 bs. rags, 260 bs. flax waste.
C. A. Cheney, by same, 110 bs. manillas.
W. F. Corne, by same, 23 bs. rags.
Horace Dutton & Co., by same, 228 bs. flax waste.
Castle & Gottheil, by same, 157 bs. rags.
C. A. Cheney, Borderer, London, 71 bs. manillas.
Horace Dutton & Co., by same, 47 bs. rags, 80 bs. waste paper.
Crocker, Burbank & Co., by same, 341 bs. waste paper.
C. A. Cheney, Michigan, Liverpool, 198 bs. manillas.
R. H. Overton & Son, by same, 86 bs. manillas.
Train, Smith & Co., Ottoman, Liverpool, 174 bs. rags.
True & McClelland, by same, 53 bs. rags, 344 bs waste paper, 23 coils manillas.
C. A. Cheney, by same, 7 bs. rags, 194 bs. manillas.
M. A. Ring & Sons, by same, 41 bs. manillas.
R. H. Overton & Son, by same, 269 bs. manillas.
Horace Dutton & Co., British Empire, London, 177 bs. rags.

Bleaching Powder.

J. L. & D. S. Riker, Columbian, Liverpool, 225 cks.
Order, by same, 22 cks.
J. L. & D. S. Riker, Ottoman, Liverpool, 179 cks.
J. L. & D. S. Riker, Michigan, Liverpool, 140 cks.

Caustic Soda.

Edward Hill's Son & Co., Ottoman, Liverpool 250 drums.

Soda Ash.

Warren & Co., Ottoman, Liverpool, 109 cks.
Wing & Evans, Cephalonia, Liverpool, 45 cks, 800 bags.
A. Klipstein, by same, 25 cks., 100 bags.
Wing & Evans, Columbian, Liverpool, 170 cks.
J. L. & D. S. Riker, by same, 168 bags.

Soda Crystals.

Warren & Co., Ottoman, Liverpool, 490 bbls.
Warren & Co., Michigan, Liverpool, 140 bbls.

Crude Sulphur.

Linder & Meyer, Columbian, Liverpool, 2,671 bags.

Sizing.

E. W. McClintock, Cephalonia, Liverpool, 408 bags.
C. A. Cheney, Ottoman, Liverpool, 338 bags.
Geo. C. Gill Paper Company, by same, 189 bags.
Thomas Groom & Co., by same, 84 bags.
Baeder, Adamson & Co., Michigan, Liverpool, 78 bags.

PHILADELPHIA IMPORTS.

FOR THE WEEK ENDED JULY 28, 1894.

Paper Stock.

Order, British Princess, Liverpool, 48 bs. bagging.

Soda Ash.

Brown Brothers & Co., British Princess, Liverpool, 167 bags.

Salt Cake.

Brown Brothers & Co., British Princess, Liverpool, 184 cks.

China Clay.

Dunn Brothers, British Princess, Liverpool, 400 cks.

EXPORTS of Paper, &c., from New York for the Week Ended July 31, 1894.

BOOKS, cases, to Liverpool, 6; British East Indies, 2; British Australasia, 30; British Guiana 2; Antwerp, 3; Central America, 3; Stuttgart, 5; Siam, 7; Argentine Republic, 1; Bremen, 1; Chili, 1; Glasgow, 4; Hamburg, 2; Hong Kong, 1; Havre, 1.

PAPER, to Cuba, 479 pkgs.; British West Indies, 70 pkgs., 65 rms.; London, 102 cs.; Central America, 42 pkgs.; Mexico, 50 pkgs.; Ecuador, 222 bdls.; Liverpool, 94 pkgs.; British Australasia, 319 pkgs.; Japan, 1 cs.; Brazil, 979 pkgs.; Colombia, 165 pkgs.; British East Indies, 22 cs.; Chili, 2 pkgs.; Danish West Indies, 50 rms.; Hamburg, 80 pkgs.; Hayti, 4 pkgs., 42 bdls.; Vienna, 1 cs.

STATIONERY, cases, to London, 23; British West Indies, 9; Central America, 14; Cuba, 5; Brazil, 1; British Australasia, 12; Liverpool, 3; Newfoundland, 1; Hayti, 3; Southampton, 1; Argentine Republic, 1; Antwerp, 1; Colombia, 14; British East Indies, 1; Ecuador, 1; Glasgow, 3; Genoa, 1; Hamburg, 3; Uruguay, 1.

CARDBOARD, cases, to Colombia, 1.

STRAWBOARD, cases, to Cuba, 1

AGGREGATES AND VALUES.

Paper, reams.....	115	$37
Paper, pkgs.....	2,325	11,101
Paper, cases.....	348	1,903
Books, cases.....	86	4,663
Stationery, cases.....	97	7,479
Rosin, bbls.....	1,467	4,507
Totals.....	4,438	$29,690

Exports General Merchandise for the week ended July 31, 1894..... $5,912,928

Comparative Merits of Engines.

Considerable discussion has arisen at this late day over the comparative merits of automatic cut-off and throttled governed engines. The general drift of the discussion appears to be toward the conclusion that where the load is constant, that is, when there is not any governing to do to speak of, it can be as well done by throttling as by cutting off the supply. There is, however, an interesting question involved. An underloaded automatic cut-off engine is notoriously wasteful, so much so that it is probably more economical to throttle the initial pressure until a desirable point of cut-off is reached. In other words, it will not do to use too high an initial pressure in a single cylinder.

Now suppose we have an engine with a fixed cut-off at one-fifth stroke, 100 pounds initial pressure, and getting a mean effective of 40 pounds, and that the load will vary from 20 to 60, the time intervals being such as to make 40 the average. An addition of 1 pound to the initial pressure will make a difference of about half a pound in the mean effective, so that by adding 40 pounds to our initial pressure we could take care of our maximum load. Would it be cheaper to maintain this pressure continuously and keep the cut-off at one-fifth, governing by throttling, which, with the superheated steam due to throttling would be very efficient; or to allow the cut-off to range into the wasteful regions on both sides of that point, or having 140 pound steam, would it be more economical to use the full initial pressure despite the early cut-off which it involves? We are considering single cylinder, not compound engines.—*Power.*

The best belting has unmistakable light buff color, which indicates that not only is it all oak tanned, but that the leather has been thoroughly washed by the currier to remove all matter except the fibre. The light buff color also indicates that only the best quality of greases have been used. If greases are of inferior quality they darken and impair the leather.

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NEW YORK: SATURDAY, AUGUST 4, 1894.

LAST year, while silver legislation was pending in Congress, a majority of opinion seemed united in the conclusion that a sound national financial policy demanded the single gold standard, and that the continued purchase and coinage of silver was a menace to both our home and foreign interests. Since then a change of view has taken place, the question no longer being how to keep silver out of the currency, but rather how to get it back and establish its proper relations to gold with the least disturbance to our finances. There is indeed a very persistent demand for a bimetallic standard of values by which a medium of exchange interchangeable with gold, at a fixed ratio, may be secured, thus permitting both a greater volume of currency and greater flexibility in the finances of trade and commerce.

MANY populous countries of the globe seem to be preordained users of silver money, and out of this fact scores of fabulous fortunes have been amassed. In such countries wages are low, and local trade consists of purchases of small quantities. Paper currency being unknown, silver has become their natural medium of exchange. Such countries have always been absorbers of the world's surplus stock of silver. Great Britain has tried to force the habits of mind of a great body of such people into new channels, but has found it unprofitable, and is now slowly changing her own attitude on the bimetallic currency question. The markets of these silver-using countries are now the most desirable in the world for manufacturing traders, and the necessity of an international settlement of the silver question becomes therefore, from this point of view, imperative, if successful trade relations are to be maintained with them.

THAT the subject is complex cannot be denied, but questions of finance quite as troublesome have been satisfactorily worked out, and there is no reason for believing that this will prove more stubborn than others. Its widespread relations will require wisdom, prudence and foresight in the solution of the problem. What position the United States will take cannot now be foreseen, but as one of the greatest silver producing countries in the world, and with an immense and growing foreign trade, her policy should lead and shape to a conclusion. We have too long been at the mercy of Europe financially. No means are at hand to prevent such a drain of gold as is now taxing our resources to the utmost limit, although Europe takes good care to resist such an outgo when conditions are reversed. Attempts have been made on the part of our Government to reach an agreement with foreign nations on the subject of restoring the bimetallic standard, but they have been fruitless. The countries of America are the silver producing countries of the world. What would be the effect were the American nations, as a measure of self-protection, to enter into an international agreement to put an export duty on silver?

CANADIAN papers are congratulating the paper and pulp makers of the Dominion upon the future which lies before them. Their bright and glowing prospects have only one obscuring cloud and that is the competition from the United States, to circumvent which there is an imperative demand for an export duty on pulp wood. One journal says: "The paper and pulp export trade of the American continent belongs rightfully to Canada, and Canada should have it." Our pending tariff bill does not, it seems, grant the full measure of Canadian desires. This is sad. Have not our legislators overlooked this necessary act of concession to the interests which lie across the border? If coal is to have a benefit, why not everything else? If we have everything to concede and nothing to secure reciprocally, why not put a few more thousand dollars of free trade, tariff reformers' (?) money into Canadian manufactures and—"let the tail go with the hide"?

THE good roads movement commends itself on its merits. At first glance it appears to be a subject belonging more particularly to dwellers in the rural districts, but considered in its commercial aspects it is a matter of concern to business men regardless of the fact of residence. Roads are legitimately a part of the transportation system of the nation, and their condition bears a close relation to the expense of doing business in, and marketing the products of urban and rural districts. It is impossible to accurately gauge this relation; but there is no doubt that bad roads are wasteful and costly. The president of the National Bureau of Road Inquiry estimates the loss to farmers alone by the increased expense of hauling over poor roads at $600,000,000 annually. Farmers themselves, however, have always been unaccountably indifferent to the condition of the roads, and the compulsory work which they have put upon them has usually been as grudgingly given as it was practically worthless in character. Indeed, road making and mending in this country have well exemplified the old saw that what is everybody's business is very apt to turn out nobody's business. The organization of a general scheme of road making and improvement applicable to all parts of the country, and the introduction of scientific methods in doing the work give promise of excellent results. Already the subject has been taken up with enthusiasm in several States, and the presence of 400 delegates from all parts of the Union at the recent Good Roads Convention at Asbury Park, N. J., augurs well for the future of the movement. In Europe, especially in its western portion, the care of highways is a Government function, and for many reasons is a matter well looked after. The attractive features of a country are greatly enhanced for travelers by roads which make jaunting out of the beaten tracks easy and enjoyable, and this is one reason why rural England always excites the enthusiasm of visiting Americans. Roadmaking in this country is a matter under the care and supervision of the States; but unfortunately it has never figured conspicuously either as a demand from the people or a political issue; therefore it is undoubtedly well within the truth to say that we have the worst roads of any country on earth. The commercial considerations belonging to the subject entirely justify the work taken up by the Good Roads Association. Its accomplishment will necessarily be slow and its benefits will be reaped mainly by future generations; but for all that it is a matter of such general importance that all men should give it encouragement. Undoubtedly in the near future all trading centres, both large and small, will be connected by car service operated by electricity, but the talk of giving up every road in the country to such a system, with spurs running to every farm house door, mill and factory in the rural districts, is extreme. Good roads will do much toward reducing the expense of marketing the products of the nation, and so far are a commercial necessity, while other considerations, such as riding, driving, bicycling and pedestrianism need not here be argued, as they clearly appeal to every mind, both in country and town.

PAPER STOCK IMPORTS.

The imports of rags and other paper making fibres—jute butts excepted—at the port of New York during the month ended July 31, as reported, amounted to 15,206 bales and 164 tons, the difference in quantities compared with the corresponding month of 1893 being a decrease in rags of 1,662 bales, in old papers a decrease of 767 bales, and in manilla stocks a decrease of 2,132 bales. There was no wood pulp imported during July, and of chemical fibre 610 tons more than the June imports were brought in. The appended tabulation shows the quantities of paper making materials of the kinds mentioned which were reported as having been imported during the month of July for the last five years:

	1894.	1893.	1892.	1891.	1890.
Rags.....bales.	6,796	8,388	8,290	14,563	9,700
Old Papers.....	117	884	1,125	1,156	913
Manilla Stocks..	8,863	10,495	14,150	12,852	15,783
Wood Pulp,tons.	....	....	....	21	....
Wood Fibre.....	164	3,496	1,427	1,275	2,084

The arrivals from the different ports were as follows: Antwerp, 61 bales rags, 16 bales old papers, 678 bales manillas; Bremen, 22 bales manillas; Bristol, 482 bales manillas; Bordeaux, 136 bales rags; Genoa, 1,094 bales manillas; Glasgow, 35 bales rags; Gothenburg, 91 bales rags, 15 tons chemical fibre; Hull, 197 bales rags, 1,267 bales manillas; Kobé, 4,941 bales rags; Liverpool, 432 bales rags, 1,111 bales manillas; London, 340 bales rags, 11 bales old papers, 730 bales manillas; Marseilles, 380 bales rags, 13 bales manillas; Newcastle, 198 bales manillas; Rotterdam, 113 bales rags, 90 bales old papers, 49 tons chemical fibre, 1,968 bales manillas, and Stettin, 100 tons chemical fibre, 800 bales manillas.

Watermarks.

BY DANDY.

No jute butts on spot! Just think of it! Once on a time such a condition of affairs might have been regarded as serious so far as paper makers are concerned, but now it causes very little comment. Paper makers are not as much interested in jute butts as they used to be, and they are leaving them in great part for the spinners to care for.

A paper merchant who was paying his office boy $3 a week developed a humorous streak the other day, and said: "Tommy, what do you do with all this money?"

"Well," came the prompt reply, "I pays me board with some of it, some more I blows in wid de boys and de rest I packs away in barrels in me cellar."

The information was much more detailed than the merchant expected, and he at once suppressed any further curiosity that he may have had.

The Chicago *Times* says: "One small paper mill has killed all the fish in an Indiana river. In so doing it has seriously hurt itself, for a goodly proportion of the annual paper output of this country is consumed in printing fish stories." Yes, but it should be remembered that the members of the paper trade furnish some of the fish stories.

It has been remarked by the trade that the imports of rags at this port have fallen off very materially as compared with last year. To give that idea a solid backing, I would state that the records show that during the first six months of 1893 there were imported at the port of New York 107,988 bales of rags, while in the corresponding time this year there were imported only 28,352 bales, or a falling off during the first half of this year of 79,636 bales.

It should be remembered that in the early part of last year the cholera scare was in full force and that this year it is not, which may possibly account for one or two of the missing bales.

The wall paper trust has been giving out its contracts for white paper. Those who secured the contracts are happy and those who did not get slices of the pie—well, they are hustling for business.

It is said that the prices paid are not so Titanic as to make dividends over abundant or over large.

There are too many ream marks made by the paper dealer who is three sheets in the wind. He may a-quire wisdom by turning over a new leaf. Then he will learn that it's not every man who can book himself up by running a wet machine with his mouth.

Trade Talks.

Col. James H. Platt, President Denver Paper Mills Company and Platte River Paper Mills Company.—Denver is making headway as usual, although the labor troubles have of course retarded business. I need not enter into any elaborate talk about the mineral resources of Colorado. Many who were engaged in mining silver have had to go into gold mining. I might add that, except for the strike at Cripple Creek, Colorado would have produced more gold than any other State in the Union. Her stone, granite, marble, fruit and other interests are being largely developed. The construction of the paper mills now in operation has made Denver the paper making section for the Trans-Missouri country. We are selling all the paper we can make, both news and other kinds. Our eastern paper making friends are working for us. We cannot make all the paper with our present facilities, but we can meet all prices made east of us either by the Eastern or the Northwestern manufacturers. We sincerely hope that some means may be found by which present prices can be advanced to a living basis.

T. H. Savery, Vice-President of the Pusey & Jones Company, Wilmington, Del.—We have now five Fourdrinier machines in process of construction, and some of them embody all of the most recent improvements, including which is a compound driving arrangement which gives to each part of the machine a fast and slow speed. The wire, for instance, may be started up at a speed of only a few feet per minute, and when the operator sees that all of the rolls are moving properly and the wire running true and straight, the speed can be greatly augmented until it reaches, say, 150 feet per minute. At this point of time, by simply moving the starting lever a little farther the fast speed is engaged and the slow speed disengaged. All of the hard work which attends the starting of the rolls is thus thrown upon a large belt which drives the slow speed, and this belt is only used when starting the machine up. It is then thrown out of use until the machine is stopped again. Meantime the belt, operating upon the cones is called into service, and comes up fresh and well prepared for the duty, as it has not been strained or overtaxed in any way in doing the hard work which attends moving the rolls from the state of rest and bringing them up abruptly to high speed. This device is original with the Pusey & Jones Company, and seems to be highly appreciated by all who have machines running at high speed.

Arthur W. Eaton, Treasurer of the Hurlbut Paper Manufacturing Company, South Lee, Mass.—Fine writing mills are feeling the industrial depression, but probably not so keenly as some other lines. It has been the disposition of manufacturers of that class of goods to run their mills as they receive orders, without aiming to push the production at the expense of prices. Manufacturers of fine writings have not been acting concertedly in the matter of shutting down, but each manufacturer has been left to do his business as seemed to him best. The absence of manufacturers of this class of goods from the annual convention was quite marked and in contrast with their attendance at previous conventions. This absence is to be deplored. While the actual results of a gathering of this kind may not be seen or felt immediately, doubtless much good is accomplished in various ways, especially in the better acquaintance among manufacturers, which, when concerted action is needed, is beneficial in bringing about the desired results. The suggestion that the association shall hold more frequent meetings is a good one, for, when manufacturers get together only once a year, it is difficult to sustain the proper interest which ought to be shown in the subjects with which we have to deal. As to business prospects in our line we hope for a decided improvement in the fall, but so much depends upon the action of Congress with reference to the tariff, that it is difficult to anticipate what the future will be.

Wellington Smith, Smith Paper Company, Lee, Mass.—All kinds of business are much depressed at the present time, but this is perhaps not to be wondered at. I think that if we could have the tariff matter settled by Congress business would increase astonishingly within sixty days. We have here a great country of sixty odd millions of people, whose wants are to be supplied, and the question is whether these wants are to be supplied by the people here or by the people of other countries. I think that it is a wise policy for this country to keep up the protective principle as the best policy to develop the country and maintain good wages and good labor. When laborers are paid well for their work they have a larger increase of purchasing power above the actual cost of living to buy luxuries and comforts with, and that is what makes business throughout the country. Of course the restriction of general business has restricted that of paper. We have had these times before, however, and this generation is now getting a taste of what the old fathers went through. We must manage business with the strictest economy compared with the volume of business done, and it may be that we have entered upon an era of lower prices for all commodities; but if we have a settled governmental policy, provided we do not have a market too low for foreign competition, we shall not have much cause for complaint.

Changes, Removals and New Firms.

W. K. Gregory, bookseller, &c., Mayfield, Ky., has sold out.

L. B. Johnson, publisher, Burlington, Vt., has sold out.

The *Weekly News*, Searsport, Me., has suspended publication.

The *Independent*, Columbia, Mich., has suspended publication.

The *Daily Recorder*, Niles, Mich., has suspended publication.

The *Record*, Salineville, Ohio, has been succeeded by the *Sun*.

Thomas Howe, publisher of the *Journal*, Elsie, Neb., has sold out.

A. O. Dexter, dealer in wall paper, &c., Troy, N. H., has sold out.

The L. & N. Company, stationer, Danbury, Conn., has sold out.

The *Weekly Advance*, Evansville, Ind., has suspended publication.

Perkins & Ellis, booksellers, &c., Clarksville, Tenn., have sold out.

V. A. Landry, publisher, Weymouth Bridge, N. S., has sold out.

N. Gale, bookseller and stationer, San Francisco, Cal., has sold out.

J. H. Murphy & Brother, booksellers, &c., Newton, Kan., have sold out.

The *Democrat*, La Grange, Ind., has been sold to Shinn & Yockey.

J. C. Williams, publisher of the *Gazette*, Cowansville, Ont., has sold out.

Miller & Scofield, publishers, Clearmont, Mo., have dissolved partnership.

A new paper has been started at Chippewa Falls called the *Republican*.

The *Sun*, Fulton, Mo., has been purchased by the *Sun* Publishing Company.

The *Register*, Lawrenceburg, Ind., has been sold to a joint stock company.

The *Free Press*, Mt. Pleasant, Minn., has been sold to Horace L. Throop.

The *Eagle*, Madison, N. J., has been sold to James A. Webb, of New York city.

Walton & Curl, booksellers, &c, Pocatello, Ind., have dissolved partnership.

Lewiston, Ill, has a new paper called the the *Fulton Leader*, edited by W. J. Duvall.

A new weekly paper, the New York *Republican*, has just been started in New York city.

M. W. Hoover, bookseller, &c., North Manchester, Ind., is reported to have sold out.

Grand Rapids, Mich., has a new paper called the *Arbitrator*, published by C. S. Young.

The *News* Publishing Company, Victor, Col., has been incorporated. Capital stock, $20,000.

Holyoke, Mass., has a new weekly paper called the *Citizen*, published in the interest of labor.

The *Connecticut Farmer*, A. R. Parsons, publisher, Hartford, Conn., has been incorporated.

Camden N. J., has a new paper called the *Weekly Argosy*, edited by H. N. Kirkbridge.

M. W. Peach, publisher of the *Republican*, Huntsville, Ark., has sold out to M. W. Miracle.

A new paper has been started in Greysboro, N. S., called the *Gazette*, published by M. H. Davidson.

The *Illustrated Chicago Century*, publisher, Chicago, Ill., has changed its style to the *Century* Company.

D. Jenkins, of Portage la Prairie, Man., will open a book and stationery store at Morden, same Province.

A new publication has just been started in the City of Mexico, Mexico, called the *Mexican Investor*. The publisher is A. P. Crowe, and the name of the journal indi-

cates the field which it is designed to represent.

Searle & Gorton, publishers, Chicago, Ill., have dissolved partnership.

Liskow & Roe, booksellers and stationers, San Antonio, Tex., have dissolved partnership.

Smith & Richardson, publishers of the *Beacon*, Wichita, Kan., have dissolved partnership.

Lexington, Ky., has a new paper called the *Evening News*, published by M. J. Simmons.

Vandalia, Ill., has a new daily paper called the *Journal*, published by Bolt & Spurgeon.

Lowville, N. Y., has a new paper called the *Taxpayer*, edited and published by J. O'Donnell.

J. D. Mills & Co., manufacturers of paper boxes, Hamilton, Ont., sold out by auction on July 14.

A company has been formed at Taylorsville, Ky., to publish a newspaper. Capital stock $3,000.

Eldredge & Brother, publishers, Philadelphia, Pa., have admitted George E. Gideon to partnership.

Santa Rosa, Cal., has a new weekly paper called *Politiks*, edited by W. C. Kellogg and T. Gregory.

The *Valley Virginian*, Clifton Forge, Va., has been changed from a weekly to a semi-weekly paper.

Bowles & McLafferty, dealers in wall paper, &c., Aberdeen, Wash., have dissolved partnership.

The Thomas C. Seidle Publishing Company, Reading, Pa., has been incorporated. Capital stock, $30,000.

San Francisco has a new weekly paper called the *American Patriot*, published in the interest of the A. P. A.

Harrisburg, Pa., has a new paper called the *Daily Telephone*, published by the Co-operative Publishing Company.

The Nashua River Paper Company, East Pepperell, Mass., has been incorporated with a capital stock of $250,000.

The Riverside Paper Company, Glastonbury, Conn., has been organized. It will engage in the manufacture of paper.

The *International Railroader* Publishing Company, Chicago, Ill., has been incorporated. Capital stock, $1,000.

W. R. Fitch, publisher of the *Times*, Lowville, N. Y., has sold out to R. R. Smiley and Frederick H. Ralsten.

Everett, Mass., has a new weekly paper called the *Independent*, published by the *Independent* Publishing Company.

The *Oddfellows' Gazette* is the name of a new quarterly journal published in the interest of the order at Montreal, Que.

Robert M. Horton has purchased the *Campbell County Standard*, Savannah, Ga., and has changed its name to the *News*.

A new quarterly has been started in Philadelphia called the *New Science Review*, published by the Transatlantic Publishing Company.

The *Blade* Publishing Company, Jackson, Tenn., has been organized by Robert Gates and J. G. Ciser to publish an evening newspaper.

Excelsior Springs, Mo., has a new daily paper called the *Call*, edited by J. W. Hyder and published by the *Call* Publishing Company.

A new journal of practical hygiene, called *Health*, has just been started in New York, published by the *Health* Publishing Company, 84 Reade street.

A new paper published at Des Moines, Ia., in the interest of colored people, called the *Iowa State Bystander*, has been incorporated. Capital stock, $5,000.

The Union *Times* Publishing Company, Union, S. C., has been incorporated by T. C. Duncan, R. P. Harry, Josiah Crudup, F. N. Farr and A. H. Foster. Capital stock $1,500.

Syracuse, N. Y., has a new morning daily paper called the *Post*, which has absorbed the weekly *Express* of that city, issuing in its place a weekly edition under the name of the *Post-Express*.

The Baker & Fogelsong Company, Dayton, Ohio, manufacturer of oyster pails and paper novelties, has disposed of its plant to the J. W. Sefton Company, of Chicago. The transfer will be made to-day.

The Valley Paper Company, Beaver Falls, Pa., was organized on July 28; capital stock $50,000. This is the company which purchased the building formerly occupied by the Hartman Manufacturing Company and the machinery of the Beaver Falls Paper Company.

The Universal Fashion Company filed articles of incorporation on July 28 in the Hudson County clerk's office in Jersey City, N. J. The capital stock is $100,000, divided into shares of $1,000 each. The company will have its principal office in Jersey City, and will manufacture patterns for wearing apparel and print fashion plates, books on dress and magazines. The incorporators are Edward Lovell, of Fairmont, N. J.; Louis Hallen, of Buffalo, and George A. Powers, of New York.

The property of the American Wood Paper Company at Spring City and Manayunk, Pa., was bought by Wing & Evans, of 22 William street, New York, on July 26. The property was sold at auction to the highest bidder. Wing & Evans represented a number of the bondholders who had previously formed themselves into a company under the name of the Schuylkill Paper Company for that purpose. The mills have been idle for more than a year and are said to represent an investment of $1,000,000. What will be done with the mills has not yet been determined, and beyond the fact that they will be sold to anyone who wants them, the object of the bondholders in bidding them in, except that it is an effort to protect themselves and retrieve losses, has not been divulged.

Failures.

Jennie Hoey, bookseller, &c., Portland, Ore., has assigned to S. L. N. Tilman.

The Utah Book and Stationery Company, Salt Lake City, Utah, has made an assignment.

Charles W. Calkins & Co., printers, Boston, Mass., have filed a petition in insolvency.

Hughes & Co., dealers in wall paper, &c., Toronto, Ont., have assigned to Charles W. Henderson.

The Pennsylvania Paint and Ochre Company, with works in Allentown, Breinigsville and Mertztown, Pa., has failed. Weston, Dodson & Co., of Bethlehem, entered execution for $11,655.

The Catholic Publication Society Company, at No. 12 East Seventeenth street, New York, has become financially embarrassed, and Wm. Angels has been appointed receiver in the Supreme Court on the application of the trustees of the company in pursuance of a resolution passed at a meeting of the stockholders on July 6 for the dissolution of the company. The liabilities are reported to be $7,116; assets not definitely known.

Fires.

S. P. More, printer, Great Bend, Pa., has been burned out.

The *Times*, Phillips, Wis., was burned out on July 30. Loss, $6,000.

The *Frei Press*, New Haven, Conn., has been damaged by fire; insured.

J. M. Goss, dealer in wall paper, &c., Monroe, La., has been burned out.

Boycott's printing office, La Crosse, Wis., was burned out on July 28. Loss, $20,000.

Clarence H. Ryder, printer, New Haven, Conn., has been damaged by fire; insured.

The *Pilot* Publishing Company, New Haven, Conn., has been damaged by fire; insured.

Curtis & Bradley, bookbinders, New Haven, Conn., have been damaged by fire; insured.

The plant of the *Clark County Herald*, Marshall, Ill., was destroyed by fire on July 31. Insurance $2,600.

The machine room of the Harris Paper Company, Harrisville, N. J., was damaged to the extent of $10,000 by fire on July 26.

F. E. Bacon & Co., printers, 34 Oliver street, Boston, Mass., were burned out on July 27. Loss, $5,000; covered by insurance.

A fire broke out on July 20 in a store house belonging to the Walloomsac Paper Company, Walloomsac, N. Y., and destroyed it with its contents. Loss not given.

The Plattsburg Pulp Mill, belonging to Allen & Sherman, Plattsburg, N. Y., was destroyed by fire on July 28. Loss, $25,000; insurance, $15,000.

On Sunday last the New York office of Harrison Brothers & Co., manufacturers of chemicals, 117 Fulton street, was damaged by fire. Loss, $8,000; insurance, $18,000.

Fire broke out in the drying rooms of the Wardlow-Thomas Paper Company's paper mill, Middletown, Ohio, on July 24, and caused a loss of $500 before it was extinguished.

The large building, 82 to 88 Fulton street, corner of Gold street, New York, was destroyed by fire on Sunday evening, July 29. The second and fourth floors of Nos. 86 and 88 and the third floor of No. 88 were occupied by Lehmaier & Brother, steam printers; the third floor of No. 86 and the fifth and sixth floors of Nos. 82 and 84 by the New York *Law Journal* as composing rooms; the fifth and sixth floors of Nos. 86 and 88 by Charles Schmelze. The flames spread to the fifth floor of No. 45 Gold street, occupied by Clark & Zugalla, printers, whose loss, principally by water, was slight. Lehmaier & Brother were badly damaged by both fire and water, principally the latter. Their insurance was $16,750. Charles Schmelze was insured for $22,875, the New York *Law Journal* for $12,600. Clark & Zugalla carried an insurance of $12,200.

The Silver Question.

Hon. William P. Maulsby, ex-judge of the Court of Appeals of Maryland, writes to THE PAPER TRADE JOURNAL as follows:

"I cannot tell you how deeply I thank you for sending me your paper, received last night. The treasure deep down in the mine of wealth of Colonel Platt's speech you may not appreciate as I do. For the plain, understandable treatment of the silver question it gives I would be willing to give almost anything that I could command. It is real patriotism, love of country, love of mankind.

"It cannot fail to be finally understood, and triumphantly adopted by all just, unprejudiced, disinterested men, who love their country above sordid wealth.

"I feel bound to discharge my last patriotic act to my fellowmen by placing it in the hands of every man in Carroll County, and Frederick County, too, as far as I can.

"The producing labor of the men of Carroll and Frederick counties has enabled me to live a long life, in fair comfort, and to raise my family on its fruits.

"I can do nothing better to attest my gratitude than to give it sound information as to how to rescue and protect itself.

"Are the types of this speech distributed, or still set up? If still up, print for me in pamphlet form, a thousand copies; send by express, and I will pay you for them. Let me know at once so that I may act accordingly.

"It is a great speech, because common men can understand it, and trust it, as it does not come from a politician."

[Colonel Maulsby and Colonel Platt would enjoy meeting each other; not only for the purpose of discussing the silver question, but also in talking over the experiences which each had in fighting for their country. Both were in the Union Army.—EDITOR.]

Mortgages, Etc.

[In the appended list R. signifies a renewal of a pre-existing mortgage; B. S., bill of sale; T. D., trust deed, and Real, a mortgage on real estate.]

EASTERN STATES.

Mortgagor.	*Amount.*
Frank Kabachink, Boston, Mass. (B. S.)	$400
Herman F. Morse, Haverhill, Mass.	300
E. B. Crapo, Concord, N. H.	1,000

MIDDLE STATES.

Stimis & Eastman, Syracuse, N. Y.	1,000
John Sterling, Watertown, N. Y. (Real)	2,750

WESTERN STATES.

M. H. Sargent (Mrs.) Moscow, Id.	600
J. N. Murphy & Son, Sioux City, Ia.	1,542
J. B. Whittaker, Falls City, Neb.	453
J. C. Morgan (Morgan & Whedon, *Democrat*), Kearney, Neb. (B. S.)	227
Daniel C. Stearn, Beres, Ohio.	1,200
E. A. Dunlap (E. A. Dunlap & Co.), Cincinnati, Ohio.	500
Ohio Traveling Bag Company, Cleveland, Ohio.	1,486
Rudolph P. Loehr, Milwaukee, Wis.	305

SOUTHERN STATES.

E. L. Hutchinson, Mammoth Spring, Ark.	174
Jordan Morton, Norborne, Mo.	650

CANADA.

R. J. Lukey, Wellington, B. C. (B. S.)	275

LIENS DISCHARGED.

Herman F. Morse, Haverhill, Mass.	600
E. M. Anderson, Annapolis, N. S.	450

Market Review.

OFFICE OF THE PAPER TRADE JOURNAL, FRIDAY, August 3, 1894.

THE MONEY MARKET.—The stock market was stronger, and the majority of moving shares closed at higher figures. The market for call loans on stock collateral was dull and steady at 1 per cent. Time loans were dull, owing to the smallness of demand. Rates were 1 per cent. for thirty days, 1½ per cent. for sixty days, 2 per cent. for ninety days and four months, 2½ per cent. for five months and 3 per cent. for six to eight months. The banks reported a small business in commercial paper. Rates were firm, as follows: Three per cent. for sixty to ninety day bills receivable, 3¼@3¾ per cent. for four months' commission house names, 4@4½ per cent. for prime and 4½@5 for good four to six months' single names. The irregularity of the market is one of its notable features. Some banks are getting fair lines, while others are buying very little. The market for foreign exchange was inactive, with demands of remitters still smaller than expected. Gold bills alone were available. Posted rates were $4.88½ for sixty days and $4.89½ for sight. Actual rates were $4.87½@4.87¾ for sixty days and $4.88½@4.89 for sight.

THE PAPER TRADE.—We do not find any great or rapid changes in the paper trade nowadays. The conditions which have ruled for some time have not changed and there is yet a very general complaint throughout the market. Mills continue to run about as they have done, but there is now a cry as to low water, which, however, is not as serious as it would be if the mills had plenty of orders on hand. There has been and is now a large curtailment of product in all lines and the fact is generally recognized and acted on that "piling up stock" is not a good thing to do at present.

JUTE BUTTS.—The market is very quiet, no trade being in progress. There are no butts on spot; the supply having been cleaned up. Advices from England quote paper quality butts at 1⅝c., and new crop for shipment is quoted at 1¼c. for paper makers' quality. The visible supply to December 1 is 74,809 bales, being 18,019 bs. paper quality and 56,790 bs. bagging quality.

WOOD PULP.—The market is quiet. Prices rule low, and there have been sales for domestic consumption at 65c. f.o.b. Export business is quiet, and even offer of $13.50 f.o.b. at seaport does not induce business, the market abroad being for the present demoralized.

WOOD FIBRE.—The demand for Chemical Fibre does not improve. Domestic Sulphite is low, and some sales are reported at lowest figure yet touched. Domestic Soda is quoted at 2¾@3½c. for Bleached. Domestic Sulphite is quoted at 1¾@2½c., as to quality, for Unbleached, and 3½c. for Bleached. Foreign grades are quoted as follows: Unbleached Pine, soda process, 2.60@2.75c.; Bleached, same process, 3½@3.90c.; Unbleached, sulphite process, 2.50@3.25c.; Bleached, do., 4@4½c.; Bleached Straw Pulp, 4@4½c. No Chemical Fibre was imported at this port this week.

FOREIGN RAGS AND PAPER STOCK.—The market continues quiet, and although there are more inquiries they do not result in a great deal of business. Belgium and Holland have forbidden the importation of rags owing to prevalence of cholera on the Continent. During the week there was a sale of 100 tons Japanese Blue Cottons ex-store at 1.45c. Imports of stock for the week aggregated 2,814 bales, being 511 bs. rags and 2,303 bs. manillas. Ports of shipment and quantities were as follows: Bordeaux, 136 bs. rags; Genoa, 1,094 bs. manillas; Glasgow, 35 bs. rags; Hull, 492 bs. manillas; Liverpool, 42 bs. rags, 393 bs. manillas; London, 298 bs. rags, 140 bs. manillas; Rotterdam, 184 bs. manillas.

DOMESTIC RAGS.—There is a moderate movement of domestic stock, but the business has very little snap to it. Prices are generally unchanged.

BAGGING, &c.—The advance in Gunny noted last week has been maintained and several buyers who are in the market for stock have been unable to secure goods at their bids. We note sale 50 tons No. 1 Gunny on spot at 1.07½c. We also note sale 50 tons Foreign Manilla Rope at 1.92½c. Manilla imports for the week aggregated 2,303 bales, being 1,094 bs. from Genoa, 492 bs. from Hull, 393 bs. from Liverpool, 140 bs. from London and 184 bs. from Rotterdam.

OLD PAPERS.—The market is quiet. We quote: No. 1 Hard White Shavings, 2⅝@2¾c.; No. 1 Soft White do., strictly free from wood, 2.15c.; Soft White do., ordinary, 1⅞@2c.; Old Ledgers, 2c.; Solid Printed Books, 1¼c.; Mixed Shavings, No. 1, 1c.; Mixed Shavings, No. 2, ¾c.; Extra No. 1 Manillas, .90c.; No. 1 Manillas, ordinary, .75c.; No. 2 Manillas, .60c.; Light Book Stock, .70c.; Folded News, .40c.; Mixed Papers, .35c.; Commons, .25@.30c.; Straw Clippings, .45c.; Binders' do., .45c.

STRAW.—Straw is fairly well sustained. We quote: No. 1 Long Rye at 65@70c.; No. 2 Long Rye at 55@60c.; Short Rye at 50@55c.; Wheat at 50c.; Oat at 50@60c.

ROSINS.—Rosins are quiet and without feature. We quote: Common to Good Strained, $1.45@1.50; E, $1.67½; F, $1.80; G, $1.90@195; H, $2.20@2.25; I, $2.55; K, $2.75@2.80; M, $3; N, $3.30@3.50; W G, $3.30@3.35.

CHEMICALS.—The market for paper makers' chemicals shows very few and unimportant, business continuing dull. Under date of July 18 J. P. Brunner & Co. speak of the Liverpool market as follows: "There is no improvement in the position of chemicals and trade is very slow in every direction. Soda Ash in retail demand, and for Leblanc makes quotations are quite nominal at about as follows: Caustic Ash, 48 per cent., £3 15s.@4 per ton; 57–58 per cent., £4 10s.@4 15s. per ton; Carb Ash, 48 per cent., £3 5s.@3 15s. per ton; 58 per cent., £3 15s.@4 per ton, net cash. Ammonia Ash, 58 per cent. in rather better request at £3 10s.@5 15s. per ton, net cash for tierces; 5s. per cent. less for bags. Soda crystals less active than usual at this season of the year at £2 12s. 6d.@2 15s. per ton, less 5 per cent. Caustic Soda slow of sale, and owing to the foreign competition prices have been reduced for some of the Continental markets; quotations vary according to market, and nominal range is about 60 per cent., £7 10s.@8 per ton; 76 per cent., £8 10s.@9 per ton; 74 per cent., £9 10s.@10 per ton; 76 per cent., £10 10s.@11 per ton, all net cash; for parcels under 10 tons 5s. per ton extra is charged. Bleaching Powder is not active, but prices are well maintained, ranging from £7 10s.@8 per ton net cash for hard wood packages, according to destination." Buyers of Bleaching Powder are very conservative, and even the drop in price for August has not stimulated business. Caustic Soda is quiet, Alkali is in ample stock and Sal Soda is in good demand. During the week there have been sales 50 cks. Bleach at 2c., 25 tons Soda Ash at 1¾c.; 50 tons 58 per cent. Alkali at 1@1⅛c.; 50 drums Caustic at 2.72½c.

CHINA CLAY.—The market is almost bare of business and there is no change in quotations.

TWINES.—There is a moderate business in progress. We quote: Sisal Hay Rope, 5@6c.; Sisal Lath Yarn, fine, 9¼c. and medium, 9c.; Jute Lines, 7½c.; Jute Ready, 7@7½c.; New Zealand Hay Rope, 6¼@7¼c.; New Zealand Lath Yarn, fine, 9¼c.; medium, 8¾c. Twines—Hemp, 4½ and 6 B Russia, 12c.; 4½ and 6 A American, 12c.; 4½ and 6 D Jute, 9½c.; 4½ and 6 L Jute, 9c.; Hemp Ball, 18 B C, 17c.; 18 C, 15c., Russian Hemp Hay Rope, 9c.

COAL.—The output of bituminous coal appears to have been more general during the past week than at any time during the three months preceding. In fact, at nearly every centre it is now said that there is an ample supply of coal and prices are reduced to what they were before the strike which began in April. Before the end of August there will doubtless be a surplus of bituminous coal in all markets. Some of the mines in Central Pennsylvania are idle, but it is expected that these will resume operations.

EDWIN BUTTERWORTH & CO.,
MANCHESTER ENGLAND,
PACKERS OF ALL KINDS OF
Paper Stock, Cotton Waste and Buffalo Sizing, Wood Pulp, Moist and Air Dry Pulp, Soda and Ground Pulp,
83 GUNNY BAGGING, &c.
OFFICE IN NEW YORK:
Vanderbilt Building, No. 132 Nassau Street,
JAMES PIRNIE, A. S. DEMAREST, } Managers.

WATERBURY
Felts and Jackets,
MANUFACTURED BY
H. WATERBURY & SONS CO.,
ORISKANY, N. Y.
Adapted to every grade of paper, from the finest to the coarsest.
The Largest Manufacturers of Paper Makers' Felts in the World.
Our wet machine or pulp felts are unequaled for durability.
For WRITING and LEDGER PAPERS We warrant a felt equal to anything imported.

PRICES CURRENT.

NEW YORK MARKET.

Paper Market.
DEALERS' SELLING PRICES.

Ledger and Record	$0.18	@	$0.24
Flat Caps, superfines	14	@	16
Flat Caps, fines	11½	@	13
Flat Caps, engine sized	7½	@	9
Blotting, American	8	@	15
Blotting, English	17	@	....
Book, super sized and calendered	6	@	9
Book, super sized and tinted	6	@	7½
Book, extra machine finish	5½	@	6
Book, machine finish, low grade	5	@	5½
News, No. 1	4	@	4½
News, rag and wood	3	@	3½
Poster	5	@	7
Hanging, superfine, No. 1	8	@	10
Hanging, superfine, No. 2	6	@	8
Hanging, machine satin	4	@	4½
Hanging, white blank, No. 1	4	@	4½
Hanging, curtain	3½	@	4
Hanging, brown	2½	@	3
Colored papers, double mediums	6½	@	8
Colored papers, glazed medium	7½	@	8½
Colored papers, tobacco	8½	@	9½
Colored papers, tissues, 20×30, ℔ ream	1.10	@	1.35
Tissues, black, 20×30, ℔ ream	1.40	@	1.80
White tissue, 20×30, ℔ ream	85	@	1.00
White tissue, 24×36, ℔ ream	1.30	@	1.50
Manillas, Flour sack, cream	10½	@	....
Manillas, Flour sack, drab	9½	@	11
Manillas, Rope, unbleached No. 1	9½	@	11
Manillas, Rope, unbleached No. 2	7½	@	9
Manillas, No. 1, light weight	6½	@	6¾
Manillas, No. 1, heavy weight	6¾	@	6½
Manillas, No. 2	5	@	6
Manillas, Bogus	2¾	@	3½
Wrapping Parchment	16	@	....
Tissue Manillas, full count, weight and size, 24×36, other sizes in proportion	75	@	80
Hardware, light colored, No. 1	9	@	10
Hardware, No. 1, glazed, tarred	7	@	8
Hardware, No. 1, glazed	4½	@	5
Binders' Boards, ℔ ton, No. 1	70.00	@	90.00
Binders' Boards, ℔ ton, No. 2	40.00	@	50.00
Strawboards, air dried, No. 1, ℔ ton	47.50	@	....
Strawboards, steam dried, No. 1, ℔ ton f. o. b. mill	....	@	34.00
Straw Wrapping, basis, 15×20, 15½ lbs., 20 sheets—			
36×40, from 28 to 42 lbs. ℔ rm	85	@	....
30×40, from 30 to 34 lbs. ℔ rm	....	@	72
24×36, from 24 to 26 lbs. ℔ rm	....	@	60
22×32, from 24 to 26 lbs. ℔ rm	56	@	....
20×30, 21 lbs., ℔ rm	....	@	44
20×30, from 14 to 17 lbs. ℔ rm	36	@	....
16×22, from 12 to 13 lbs. ℔ rm	28	@	....
18×28	....	@	32
15×20, 10 lbs. ℔ rm	17	@	19
15×20, from 7 to 8½ lbs. ℔ rm	17	@	19
14×18	....	@	15
12×16	....	@	13
11×15	....	@	11
Straw Wrapping, ℔ lb., heavy weight	1.75	@	1.85
Straw Wrapping, ℔ lb., light weight	1¾	@	....
Cigarette, Straw Tissue, per case of 100 boxes, 50 books to the box, 200 sheets to the book	21.00	@	30.00
Tea Papers, 16 sheet quires—			
12×18	18	@	20
14×30	22	@	....
Card Middles, ground wood	5½	@	6¼
Card Middles, long fibre wood	8½	@	9
Card Middles, rag and wood	6	@	9
Pulp Lined Boards, single manilla, No. 100 and heavier	42.50	@	....
Pulp Lined Boards, double manilla, No. 100 and heavier	47.50	@	....

Wants and For Sale.

Twenty-five words or less, one dollar each insertion. Over twenty-five words, four cents a word each insertion, up to eighty words. Cash should accompany order.

Over eighty words, or displayed advertising, will be charged for by the inch, according to our regular schedule of rates.

Answers can come in our care and will be promptly forwarded without extra charge.

WANTED—POSITION BY A NO. 1 SUPERINtendent in wood, manilla or news mill; is also familiar with business department; has been with one of the largest mills in the country; best of references. Address FIRST-CLASS, care of Paper Trade Journal.

WANTED—A POSITION AS SUPERINTENDent or foreman by thoroughly competent man who fully understands both jute and wood fibres; best references. Address H., care of Journal.

WANTED—POSITION TO RUN FOURDRInier machine or engine; nineteen years' experience; am married and temperate; A1 reference. Address PAPER MAKER, Box 386, Newmarket, N. H.

SITUATION WANTED,

By young married man, as boss in color department; understands mixing colors for fine colored, white plated and chromo papers, enameled and glazed, ivories and satins for lithograph, bristols, boxboards and wedding cards; can give good references. Apply to COLOR MIXER,
Post Office Box 818, Holyoke, Mass.

THE SWEET MILL, AT PHŒNIX, N. Y., will be sold under a decree of the Court at Public Auction August 11, at 9 A. M., at the law office of Avery & Merry, Phœnix, N. Y. The mill contains one 44 inch paper machine, with other necessary machinery for making a fine grade of tissue paper, has abundant water power and has been in operation but a short time. For further particulars apply to the undersigned, or to Avery & Merry, Attorneys, Phœnix, N. Y. FRANK B. DILTS,
Fulton, N. Y.

TO RENT—A FRONT ROOM, CONTAINING about 550 square feet of floor space, first loft, in building occupied by The Lockwood Press, on the southwest corner of Duane and Church Streets. Apply to HOWARD LOCKWOOD & CO., on the premises.

FOR SALE, CHEAP—ONE FOURDRINIER machine, 62 inch dryer, 68 inch wet part. Apply B. D. & CO., 75 Duane Street, New York.

FOR SALE—A PAPER MILL IN CENTRE OF New York State; only a small amount of money required. I. S. DILLINGHAM, 67 Federal street, Boston.

FOR SALE.

Six 48 inch copper dryers, 28 inches diameter, with frames.
Three 48 inch Knight iron dryers, 14 inches, with frames.
Two stacks calendars, 48 inch face, of four rolls each; also frames and four extra rolls.
One 48 inch Gavit cutter.
One each first and second press rolls.
Two cylinder molds.
Four upright reels.
One Roy 48 inch roll grinder.
Also small rolls and pulleys.
Will sell cheap in parts or whole.
NIXON PAPER COMPANY, Richmond, Ind.

FOR SALE.

A set of six 86 inch revolving reels, new, our make, with heavy frames, gears, tension wheels, endwise adjustment, driven by weighted friction, a power rotating attachment and a reel turning device.
THE BLACK & CLAWSON CO.,
Hamilton, Ohio.

FOR SALE.

Four 1,000 pound Umpherston Beating Engines, complete, with patent copper washers, sand traps, &c. Engines in first-class condition and now running, but to be taken out to make room for other machinery. Address UMPHERSTON,
care of Paper Trade Journal.

A FINE OPPORTUNITY
TO GO INTO BUSINESS.

To a company that understand the coating business an offer will be made to furnish a fully equipped plant, ample room with plenty of power. Well situated for future business. Will either lease plant or take an interest in the business. Parties answering advertisement must be in position to furnish all necessary capital to buy stock and carry accounts.
Address A. B. C., care of Journal Office.

TO LEASE.

The Hanmer & Forbes Company's Manilla Mill.

BURNSIDE, Conn., April 10, 1891. C. F. HANMER, Secretary.

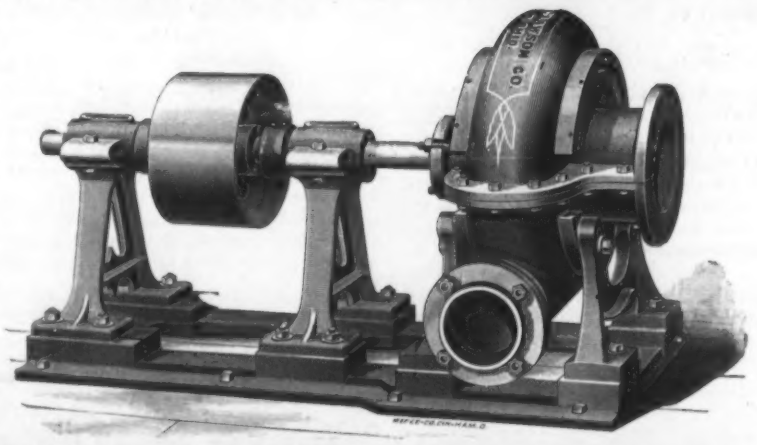
NOTICE.

My attention having been called to the fact that certain parties are infringing certain Letters Patent granted to me, to wit: No. 212,866, dated March 4, 1879, covering a new form of carpet lining, and No. 285,698, dated December 21, 1880, covering the method of and apparatus for making the same, this is to notify all such persons, whether manufacturers or dealers, that any infringement of either of said patents will be prosecuted to the full extent of the law. MOSES NEWTON, Patentee.

PAPER MILL MACHINERY.

One 84 inch Fourdrinier part to paper machine complete, with Gould screen.
One 74 inch Fourdrinier machine complete, Gould screen; gun metal press rolls, 15x75 inches; eight iron dryers, 36x72 inches; stack of nine chilled rolls, 72 inch face; upright reel and cone pulley cutter; Bess slitters.
One Gould screen, eight plates, 10x36 inches.
One Gould screen, eight plates, 12x40 inches.
One Barber's suction.
One 70 inch machine complete, Gould screen, Fourdrinier wire, 70x33 inches; first and second presses; eight iron dryers, 36x65¼ inches; stack five chilled rolls, four 12 inches, one 16x64 inches face; upright reel, slitter and winder.
Two new 1,000 pound Holyoke Machine Co. beaters, wood tubs.
One 1,000 pound iron tub beater.
Six beating engines, 36 inch roll, iron tubs.
One 1,200 pound Horne patent engine, new.
One rotary, 7x20, double riveted, 9-16 inch shell.
Three Scott & Roberts hydraulic pulp grinders.
Three Jordan engines.
Two rag cutters and duster.
Four iron dryers, 28x72 inches.
Send for catalogue of machinery, steam engines and boilers.
1,000 feet shafting, 2 to 6 inches diameter; 500 feet belting, 5 to 48 inches wide.
Parties wanting tools, stock or machinery used in a paper or pulp mill can find it here at a bargain.
F. H. DAVIS & CO., Exchange B'd'g, Boston, Mass.

THE BLACK & CLAWSON CO., MANUFACTURERS OF Paper Mill Machinery,



FOURDRINIER,
HARPER IMPROVED FOURDRINIER AND CYLINDER MACHINERY.

JORDAN ENGINES.

Jordan Engines Refilled.

Screens, Calenders, Rag Cutters, Cylinder Molds, Deckel Straps, Paper Cutters, Screen Plates, Dandy Rolls, Stuff Box Trucks, Iron and Brass Castings.

REVOLVING REELS AND STACK REELS.

FOR PARTICULARS ADDRESS
THE BLACK & CLAWSON CO., Hamilton, Ohio.

WE MAKE THE ONLY PERFECT DRYER.

MEDAL AWARDED AT WORLD'S FAIR FOR OUR SEAMLESS DRYER.

—THE—
Cedar Point Foundry,
PORT HENRY, N. Y.

WOOD PULP GRINDERS,
WET MACHINES,
Jeffers Suction Screen.

Made in three sizes: Eight, Nine and Ten Plates.

☞ SEND FOR BLUE PRINTS.

ESTABLISHED 1840.
GEO. J. BURKHARDT'S SONS'
Cedar Tank Factory,
2831 TO 2839 NORTH BROAD ST.,
Philadelphia.

CHRISTIANA MACHINE CO.,
Christiana, Pa.

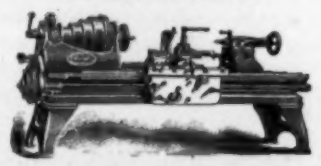
MANUFACTURERS OF
THE BALANCED GATE
Turbine Wheel.

Suitable for Light or Heavy Service.
Globe Outer-Cases and Special Wrought or Cast Iron Flumes,
SUITABLE FOR ANY SITUATION.
GEARING of all kinds, SHAFTING, PULLEYS and everything required for a complete POWER PLANT.

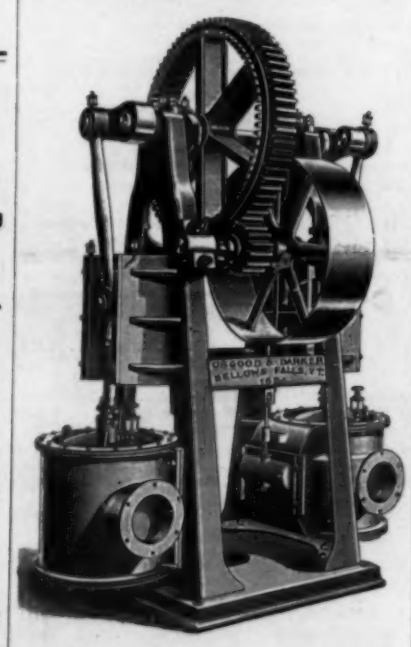
Satisfaction Guaranteed. Designs and Estimates furnished on application. Send for Catalogue.

FOR SALE—A SECOND-HAND COPY OF HOFmann's Treatise on Paper Making in good condition for sale cheap. For further particulars address URGENT, care Paper Trade Journal.

NEW HAVEN MANUFACTURING CO.,
NEW HAVEN, CONN.,
MANUFACTURERS OF



Lathes, Planers, Drills,
SLOTTERS, &c.



VACUUM PUMP.
Weight, Four Tons.

MANUFACTURED BY
OSGOOD & BARKER,
Bellows Falls, Vt.,

MANUFACTURERS OF
Sulphur Burners,
Acid Pumps,
Barkers,
Chippers,
FOR SULPHITE PLANTS.
Fourdrinier and Cylinder Paper Machines,
With one, two, three or four stacks of dryers.
Upright Reels, with two or three Drums,
Reel Stacks and Revolving Reels,
Rewinding and Slitting Machines,
Calender Buffing Machines
For buffing ends of the rolls.
Ground Wood Pulp Machines,
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Pulp and Paper Machinery
For all kinds of Paper.

WRITE FOR DESCRIPTIONS AND PRICES.

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Successors to E. P. TANNER'S
FOUNDRY AND MACHINE WORKS,
LEE, MASS.,
MANUFACTURERS OF
New and Improved Spiral Knife Rag Cutters,
Cylinder Paper Machines, Rag Engines, Paper Cutters, Super and Machine and Chilled Iron and Paper Roll Calenders, Stuff and Fan Pumps, Shafting, Pulleys, Gearing and Paper Mill Machinery generally.

DO YOU WANT A . .
RAG CUTTER,
TO CUT ROPE, JUTE BUTTS, BAGGING, OR ROOFING PAPER STOCK?
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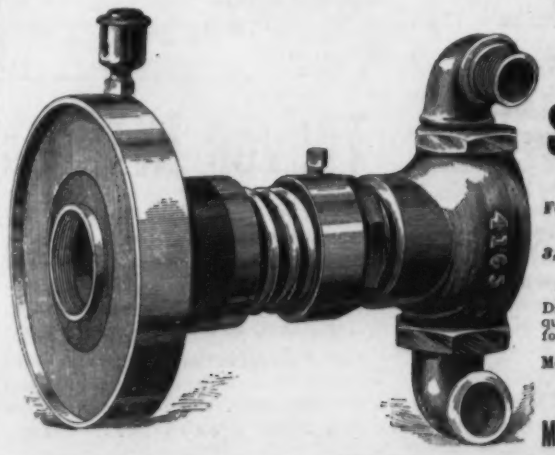
Manufacturers of Straw Boards, Pulp Lined Boards,
Lined Straw Boards, Combination Boards, Binders' Boards,
"LIGNISTRA." Friction Boards, Building Board, Plain Board, Tarred Board, Waterproof Boards, Barrel Layers, Peach Baskets, Egg Cases and Fillers.
General Office, PULLMAN BUILDING, CHICAGO.
AGENCIES: New York, 102, 104, 106 Wooster St. Boston, 46 Federal St. Philadelphia, 121-127 N. Fourth St. Cincinnati, 101-103 Walnut St. Chicago, 152-153 Michigan Ave.



The ROACH PATENT METALLIC Steam Joint
Patented May 13, 1884, and Sept. 8, 1885.
For Rotary Paper Dryers and Revolving Cylinders.
3,000 NOW IN USE on PAPER MACHINES.
Does away with Packing the Dryers. No Leakage of Steam. Requires No Attention and will Last for Years.
Medal Awarded at World's Fair.
Send for Circular and Price List.
M. J. ROACH, ANDERSON, IND.

RIVERSIDE PAPER CO.,
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"MAGNA CHARTA" BOND, "PURE LINEN STOCK" LINENS (WHITE WOVE AND CREAM LAID), "DUNDEE RECORD" LEDGERS.

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ANIMAL SIZED AND SUPERCALENDERED BRISTOL BOARD, BOX BOARD, DUPLEX AND COVER PAPERS. IN WHITE, TINTS AND COLORS.

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CONTRACTS FOR
News and Book Paper in Quantity.
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Don't Guess at Important Matters.

Bowsher's SPEED or MOTION INDICATOR
IS INDISPENSABLE
In obtaining a UNIFORM speed of machinery, and is one of the most PROFITABLE little devices ever put in a mill. Will pay for itself in 30 days. Dial 12 in. in diameter. Weight 10 pounds.
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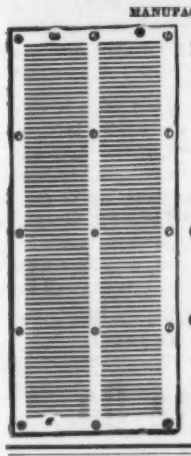
MANUFACTURERS OF



SCREEN PLATES

—OF—

BRASS

—OR—

CAST METAL.

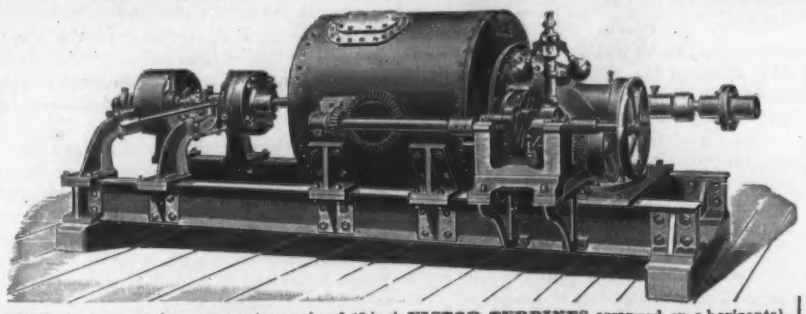
REPAIRING

OLD SCREEN PLATES

A SPECIALTY.

THE VICTOR TURBINE.

UPRIGHT or HORIZONTAL.



THE above engraving represents a pair of 12 inch **VICTOR TURBINES** arranged on a horizontal shaft, with Cast Iron Flume, Draft Tubes, End Bearings for Shaft, and Driving Pulleys complete, all mounted upon a substantial cast iron bed plate. The entire arrangement is very complete and strictly first class in every particular. We are now prepared to furnish Victor Turbines, either single or in pairs, on horizontal shafts, and where the situation admits of their use we recommend them.

In use in a large number of best Paper and Pulp Mills in this and other Countries.

CYLINDER OR REGISTER *GATE.*

INSURING HIGHEST PERCENTAGE OF USEFUL EFFECT AT

FULL AND PARTIAL GATE.

TESTS IN HOLYOKE FLUME.

SIZE WHEEL.	HEAD IN FEET.	HORSE POWER.	PER CENT. OF USEFUL EFFECT
15 inch	18.06	30.17	.8932
17½ inch	17.96	36.35	.8930
20 inch	18.21	49.00	.8532
25 inch	17.90	68.62	.8584
30 inch	11.65	52.54	.8676
35 inch	17.29	133.19	.8497
40 inch	16.49	148.93	.8253
48 inch	15.51	179.29	.8202

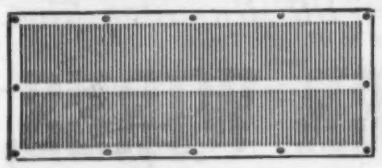
Such results, together with its nicely working gate and simple, strong and durable construction, should favorably commend it to the attention of all discriminating purchasers.

THESE WHEELS ARE OF VERY SUPERIOR WORKMANSHIP AND FINISH.

THE VICTOR WHEEL is particularly adapted to setting on **HORIZONTAL SHAFT,** DISPENSING ENTIRELY WITH GEARS.

STATE YOUR REQUIREMENTS AND SEND FOR CATALOGUE TO

THE STILWELL-BIERCE & SMITH-VAILE CO., DAYTON, OHIO, U. S. A.



OLD PLATES RENEWED.

World's Fair

HIGHEST AWARD

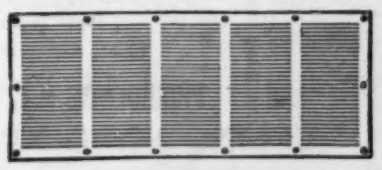
TO

SCREEN PLATES of SPECIAL BRASS,

MADE BY THE

Western Screen Plate Works,

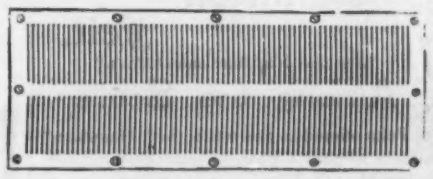
545 Eldorado St., APPLETON, WIS.

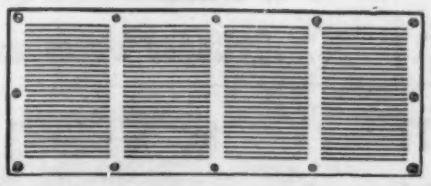


ANNANDALE

Screen Plate Co.,

PATERSON, N. J.





Manufacturers and Repairers of

SCREEN PLATES.

Our new Plates are made of the **VERY BEST METAL,** and for price and durability cannot be surpassed.

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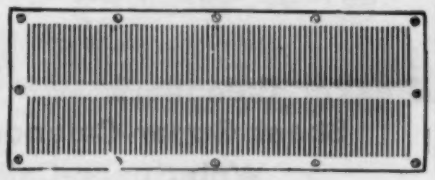
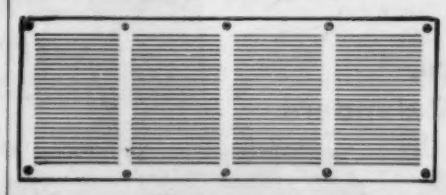
21 Main St., FITCHBURG, MASS.,

MANUFACTURER OF

Screen Plates





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AT PRICES

THAT CANNOT BE SURPASSED.

BEST STOCK USED.

Write for Prices and Gauges.

All Work Warranted.

METAL SKYLIGHTS

Absolutely no leakage from any source; no dripping or sweating; fire-proof; ventilating.

THE CLOVER LEAF

VENTILATOR

FOR MILLS, FACTORIES AND DYE HOUSES.

Made of galvanized iron or copper. Strong upward draft; exhausts foul air, odors, gases, steam, etc. Perfectly storm-proof. Send for illustrated circular.

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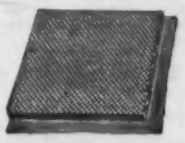
THE EVANS FRICTION CONES

Are running forty-four (44) of the best paper machines in this country and in Europe, transmitting from 20 to 40 horse power each. Thousands of small Cones, hanging and standing, in operation, driving all kinds of machinery. Send for Catalogue "G."

EVANS FRICTION CONE CO., 85 Water St., Boston, Mass.

SAMPLES AND QUOTATIONS FURNISHED UPON APPLICATION.



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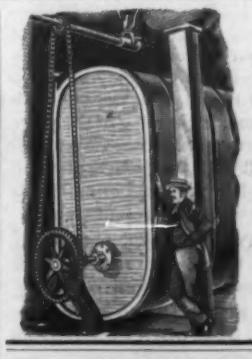
Asbestos Prepared Roofings.

(Specially adapted to Paper Mills).

Chicago, Ill. **H. F. WATSON COMPANY,** Erie, Pa.



THE SAVAGE PERFECTING STUFF CHEST.

Fits into a narrow space and requires but little power to operate.

It has a double agitating motion, moving the stuff in different directions, which prevents "floating."

It empties itself clean; no waste of stuff and protects from dirt.

Quantity of stuff in chest always shown by indicator.

In writing give space in height, length and breadth if pressed for room; also the amount of stock in dry paper that the chest is wanted to hold.

PATENTED AND MANUFACTURED BY

E. L. SAVAGE, Mechanic Falls, Me.

FOSTER & BROWN, SACCARAPPA, MAINE.

MACHINISTS AND IRON FOUNDERS.

SPECIALTIES:

Improved Paper-Coating Machines; Hanging Machines and Power Reels for Coated Paper; the Merrill-Foster Noiseless Pulp Screens; Paper Slitting and Trimming Machines; Hardened and Ground Slitters; Automatic Elevators.

BUILT UNDER OUR OWN SUPERVISION.

THE "WANDEL" Patent Rotary STRAINER

Is the best Screen on the market, and is now used in

148 Paper Mills in Germany.
25 Paper Mills in Austria.
85 Paper Mills in France.
12 Paper Mills in Switzerland.
31 Paper Mills in Italy.
16 Paper Mills in Spain.
26 Paper Mills in England.
9 Paper Mills in Sweden and Norway.
10 Paper Mills in Russia.
And in the Thilmany Pulp and Paper Mills, Kaukauna, Wis.

The "Wandel" Patent Rotary Strainer is delivered ready for use, with or without the bearing frame.

FOR FURTHER PARTICULARS APPLY TO

CHR. WANDEL, Reutlingen, Germany.

Or GEORGE HAMILTON. 74 Wall St., New York.

THE MORRISON & HERRON TESTING SYSTEM.

THE MORRISON & HERRON IMPROVED PAPER TESTING MACHINES.

Three Different Machines

—FOR—

Strength, Thickness and Weight.

A NEW PRINCIPLE APPLIED IN TESTING PAPER.

Thickness shown to the sixteen-thousandth part of an inch.

Used in the GOVERNMENT PRINTING OFFICE and the DEPARTMENTS at Washington.

Price, complete,	$150.00
Or Strength Indicator,	75.00
Thickness Gauge,	75.00
Paper Scale,	20.00

ADDRESS ALL ORDERS TO

HOWARD L. MORRISON,

1009 Pa. Ave., N. W., Washington, D. C.

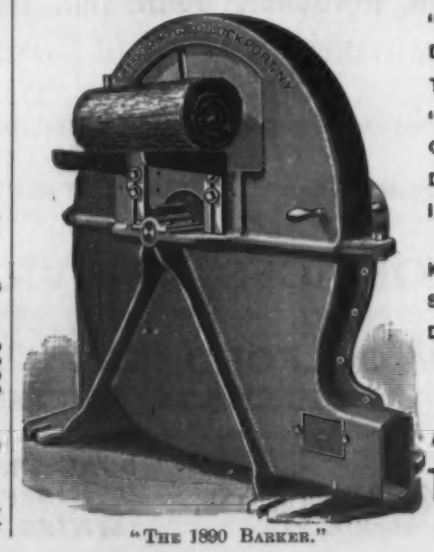
CAUTION.

All persons are liable to prosecution who make buy or use Paper Testers that confine and break paper within its edges, as my Patents cover that method.

TREVOR MANUFACTURING CO., LOCKPORT, N. Y.

MANUFACTURERS OF

IMPROVED WOOD PULP MACHINERY.



"THE 1890 BARKER."

"Niagara" Grinders,

Double and Single Splitters,

The "Trevor" Improved Wet Machines,

"1890" and "Giant" Barkers,

Cross Sawing Machines,

Drag Saw Machines,

Improved Pulp Wood Slabbing and Sawing Machines,

Knot Borers,

Stuff Pumps,

Double and Triple Plunger Pumps, for general use in Pulp and Paper Mills.

Write for Catalogue C and Discounts Address

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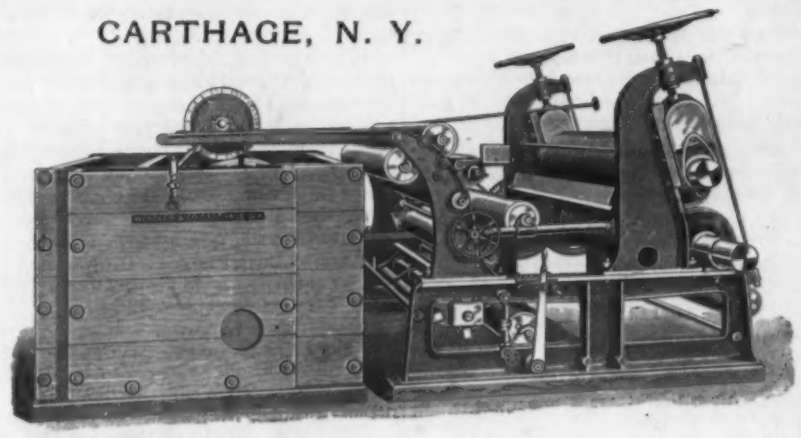

STANDARD WET MACHINE.

A Full Line of Centrifugal and Fan Pumps.

ALL MACHINERY AND APPLIANCES USED IN THE MANUFACTURE OF WOOD PULP AND SULPHITE FIBRE.

Manufacturing News.

EASTERN STATES.

The Riverside Paper Company, Glastonbury, Conn., has bought land, and will at once proceed to build a paper mill.

The Stark Paper Company, North Bennington, Vt., is repairing the trunk at its mill and making other improvements.

The Cushnoc Fibre Company, Augusta, Me., has put in two eight plate 12x40 inch "Gotham" screens on its 86 inch Fourdrinier.

The United States Cordage Company, of New York, has purchased the plant and good will of the Pearson Cordage Company, of Boston, Mass., and took possession of the property last Wednesday.

The rag room of the Carew Manufacturing Company, South Hadley Falls, Mass., was started again on July 28, with prospects good for keeping the department running right along.

MIDDLE STATES.

The mill of the Piercefield Falls Paper and Mining Company, Piercefield Falls, N. Y., will be a one story structure 80x500 feet. The boiler house and acid plant will be located outside of this building. The buildings will stand on a level plot of land about 100 feet below the fall, the river having a fall of 30 feet, producing 3,000 horse power. The dam will be located about 400 feet above the fall and the water for this distance will run through an open flume. The remaining 100 feet it will be carried to the mill through two penstocks. Four grinders, each 26x50 inches, will use from 450 to 500 horse power and produce 5 tons of wood pulp a day. The digesters will be of the Friend-Stebbins make, two in number at the outset, but with the idea of increasing to four. At the beginning sulphur will be used in the preparation of the acid, but the acid plant will be made with a view to changing to pyrites. There will be two Fourdrinier machines and one cylinder machine. Work on the mill will probably be started in a few weeks, and the plant will be in operation by next spring.

The mill owners on Skaneateles Creek, Skaneateles, N. Y., have appealed from the order of the court affirming the awards of damages for loss of water taken from Skaneateles Lake by the city of Syracuse.

The Warren Manufacturing Company, Riegelsville, N. J., recently put a large belt on its steam engine at the Hughesville Mill in order to run during low water. It has previously been obliged to shut down nearly half of every night during the summer.

The Brownville Iron Works, Brownville, N. Y., report active trade and orders ahead for over thirty "Gotham" screens; other large orders are reported to be in sight.

The Musconetcong Mill, Riegelsville, N. J., is running on short time, on account of low water.

The Racquette River Paper Company, Potsdam, N. Y., will put in an "Underwriters'" pump, and lay a line of water mains with six hydrants outside of its buildings. It will also put in a nine roll stack of calenders. A set of screens for screening the chips has been added, and an apparatus for recovering acid will be put in the sulphite plant. Arrangements are also being made to increase the head of water.

The Packerack Mill, Reading, Pa., has been started up after a prolonged shut down.

James Thompson has bought the mill of the Valley Falls Paper Manufacturing Company, Valley Falls, N. Y., which has been idle for a long time.

The Remington Paper Company, Watertown, N. Y., has put in four eight-plate 12x40 inch "Gotham" screens to run on sulphite fibre.

Russell & Sons, Penn Yan, N. Y., have changed from straw wrapping to a low grade manilla. They are reported to be working a special grade of paper for grocers' and butchers' bags.

The Sylvan Mill, Averill Park, N. Y., has been sold by A. J. Smart to a Mr. Miller, of Newark, N. J.

H. Powell Ramsdell, Salisbury Mills, N. Y., is making extensive improvements in his mill, including putting in three new water wheels. He has quite a large force of men on hand to push the work with all possible speed.

WESTERN STATES.

The Consumers' Paper Company, Muncie, Ind., has constructed four large settling ponds, covering two acres each. The waste water from the mill goes first to a settling vat 40x10 feet and 4 feet high. Here all the joints from the straw, knots, &c., are collected until the vat is ready to be emptied, when the flood gate is removed and the water is conducted through wooden spouting to one of the ponds. It stands in this pond for four days, and the flood gate from the pond is lifted and the water runs off into the river. This is repeated with each pond after the water has stood four days. On examining the water when ready to be emptied from the pond it is found to be about as clear as ordinary cistern water. This system was adopted in deference to protests against emptying the mill refuse into White River, whereby fish were killed.

The Straw Haulers' Association, composed of farmers living in the vicinity of Vandalia, Ill., has attempted to run a boycott on the Vandalia Paper Mill Company. A number of farmers east of the river had engaged their straw to the paper mill company, and had been delivering it. On July 28 L. S. Sandago was waited upon by several of the farmers and warned not to haul any more straw, lest his wagon would be overturned and the straw burned. Others not in the association have likewise been threatened. The non-union haulers have armed themselves and are determined to deliver their straw at the peril of their lives. As the members belonging to the union are equally determined, trouble of a lively sort is feared. The purpose of the association is to force the paper mill company to pay a higher price for straw than at present. To enforce its demand for a raise in the price the association ordered that no straw be delivered to the mill until the price contended for was given. It was the ignoring of this order which provoked the present trouble.

The Delphos Paper Mill, Delphos, Ohio, has put in an eight plate, 12x40 inch "Gotham" screen for use on its machine.

It is rumored that the Wood Fibre Company, Wellsville, Ohio, will remove its plant to Winchester, Tenn.

SOUTHERN STATES.

A wood pulp mill, of 6 tons daily capacity, will be built by J. R. Tuff and others, at Sparta, Tenn.

The Record Pulp Mill, Elkton, Md., has been started up after several weeks' idleness.

R. L. Burnet, Dallas, Tex., contemplates establishing in New Orleans the largest paper box factory in the South.

The Susquehanna Water Power and Paper Company, Conowingo, Md., is erecting an addition to its paper mill, and will put in machinery for stamping wall paper.

Personals.

Theodore Conrow and family are at Lake Placid.

R. B. Atterbury and family are at Watch Hill, R. I.

Col. A. G. Paine and family are at Wave Crest, L. I.

Henry Atterbury and family are at Summit, N. J., for the summer.

F. W. Wilson, of Osborn & Wilson, has gone East for two weeks with his family.

Albert Salomon, of Felix Salomon & Co., with his wife, is at the Thousand Islands.

F. X. Black, of the Black & Clawson Company, Hamilton, Ohio, sailed from Europe for home this week.

Sidney F. Walker, of the Jessup & Moore Paper Company, returned this week from a pleasure trip to Lake Ontario.

George J. Carter, formerly with Felix Salomon & Co., is now with the Empire Type Setting Machine Company, New York.

Madame O'Meara, of the Convent of the Sacred Heart, Montreal, Canada, sailed for Europe to day on the Umbria, and will be absent a year or more. She is a daughter of Maurice O'Meara.

The full page portrait of Lord Russell, the new Chief Justice of England, in the current number of the *Review of Reviews*, looks very much like Wm. A. Russell, of Boston. It is probable that both gentlemen had the same ancestors generations ago.

On Monday J. S. Nugent resigned as secretary of the National Folding Box and Paper Company, and H. S. Munson was elected to succeed him. Mr. Nugent remains as a director of the company, but will give the greater part of his time to the American Union Life Insurance Company, of which he has been elected treasurer. Mr. Nugent has always been successful in the paper business, and his friends' best wishes go with him for equal success in his new line.

In Town.

L. Dilworth, Pittsburg, Pa.; L. Allen, Sandy Hill, N. Y.; Wellington Smith, Lee, Mass.; William Whiting, Henry Spencer and F. H. Sturtevant, Holyoke, Mass.; N. T. Pulsifer, Manchester, Conn.; G. W. Knowlton, Watertown, N. Y.; G. F. Barden, Adams, Mass.; W. M. Crane, Dalton, Mass.; C. M. Barden, Westfield, Mass.; W. E. Wagg, Lambertville, N. J.; F. L. Stevens, North Hoosick, N. Y.; George T. Keyes, Boston, Mass.

Short belts require to be tighter than long ones. A long belt working horizontally increases the grip by its own weight.

Accidents.

William Sherry was horribly mangled in the machinery of the Anderson Paper Company's mill on July 24.

Edward J. Breen, who was severely scalded on July 21 while repairing a steam pipe in one of the mills of the Glens Falls Paper Mill Company, Fort Edward, N. Y., died on July 26.

Alfred Poindexter, an employee of the Bennett Paper Company, Kansas City, Mo., fell through an elevator shaft from the third floor on July 23. He was not seriously injured. Poindexter had gone to the third floor for some tags. He was in a hurry, and left the bar which protects the shaft open. The elevator has no cover, as it is used by the employees only in moving packages from one floor to another. While Poindexter was after the tags an employee on the first floor pulled the rope, and the elevator was lowered to first floor. The third floor being imperfectly lighted, Poindexter did not notice that the elevator had disappeared. He stepped into the shaft and fell to the bottom. His injuries were found to consist of a contusion of the back of the head and a few cuts and bruises on his body.

William Biggart, employed in the mill of the Walloomsac Paper Company, at Walloomsac, N. Y., fell through an opening in the floor of the third story of the mill to the floor below, a distance of about 12 feet, on July 19, and striking on a saw horse fractured his right hip, and received severe cuts about the head.

Oswald Fuchs was instantly killed at the mill of the Glens Falls Paper Company, Fort Edward, N. Y., on July 22. He was a machinist and was engaged in repairing the machinery when he stepped upon the lower part of the belt connected with the driving wheel of the engine. The wheel made several revolutions and Fuchs was crushed to a shapeless mass. He leaves a widow and three children.

The following is proposed as a simple method of testing leather used for belting: A small piece is cut out of the belt and placed in vinegar. If the leather has been perfectly tanned, and is therefore of good quality, it will remain immersed in vinegar, even for several months, without any other change than becoming of a little darker color. If, on the contrary, it is not well impregnated with tannin, the fibres will promptly swell, and, after a short time, be converted into a gelatinous mass.

THE
"Hamilton"
Felt.
"Best and Most Economical Made."
Among the Score
of Felts offered to the trade, the "Hamilton" stands without a peer. Thoroughly reliable, it is sold at the same prices as inferior makes. Lots of Felts, but only one "Hamilton."
In ordering mention kind of stock used, quality of paper made and speed of machine.
Shuler & Benninghofen, Hamilton, Ohio.

The W. S. Tyler Wire Works Co.,
CLEVELAND, OHIO.
MANUFACTURERS OF
FOURDRINIER WIRES,
Cylinder Faces and Washer Wires.

GRANGER
Foundry and Machine Co.,
MANUFACTURERS OF
Breaker Calenders,
Sheet Super-Calenders,
Web Super-Calenders,
Friction Calenders,
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AYERS'
Patent Winder.
HYDRAULIC
Presses and Pumps.
Chilled Iron Rolls,
Cotton Rolls,
Paper Rolls.
PROVIDENCE, R. I.

The American Talc Co.,
MANUFACTURERS OF A
SUPERIOR QUALITY OF MINERAL PULP OF ALL GRADES,
PROVIDENCE, R. I.
MINES AND MILL: FOWLER, N. Y.
NEW YORK OFFICE: ROOM 23 PARA BUILDING, 35 WARREN ST.
TELEGRAPH ADDRESS: GOUVERNEUR, N. Y.
NEW MILL. LATEST MACHINERY. STEAM POWER.

THE GENERAL FIRE EXTINGUISHER COMPANY,
CONTROLLING THE INVENTIONS AND APPARATUS
PERTAINING TO AUTOMATIC SPRINKLERS OF
Frederick Grinnell, William Neracher, John Hill, William Kane and others.
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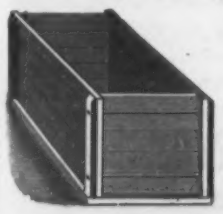
AND AT THE
EXECUTIVE OFFICES, PROVIDENCE, R. I.


GEO. WOOLFORD, Manufacturer of all kinds of
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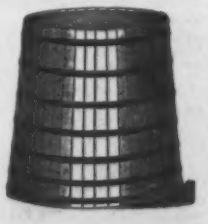


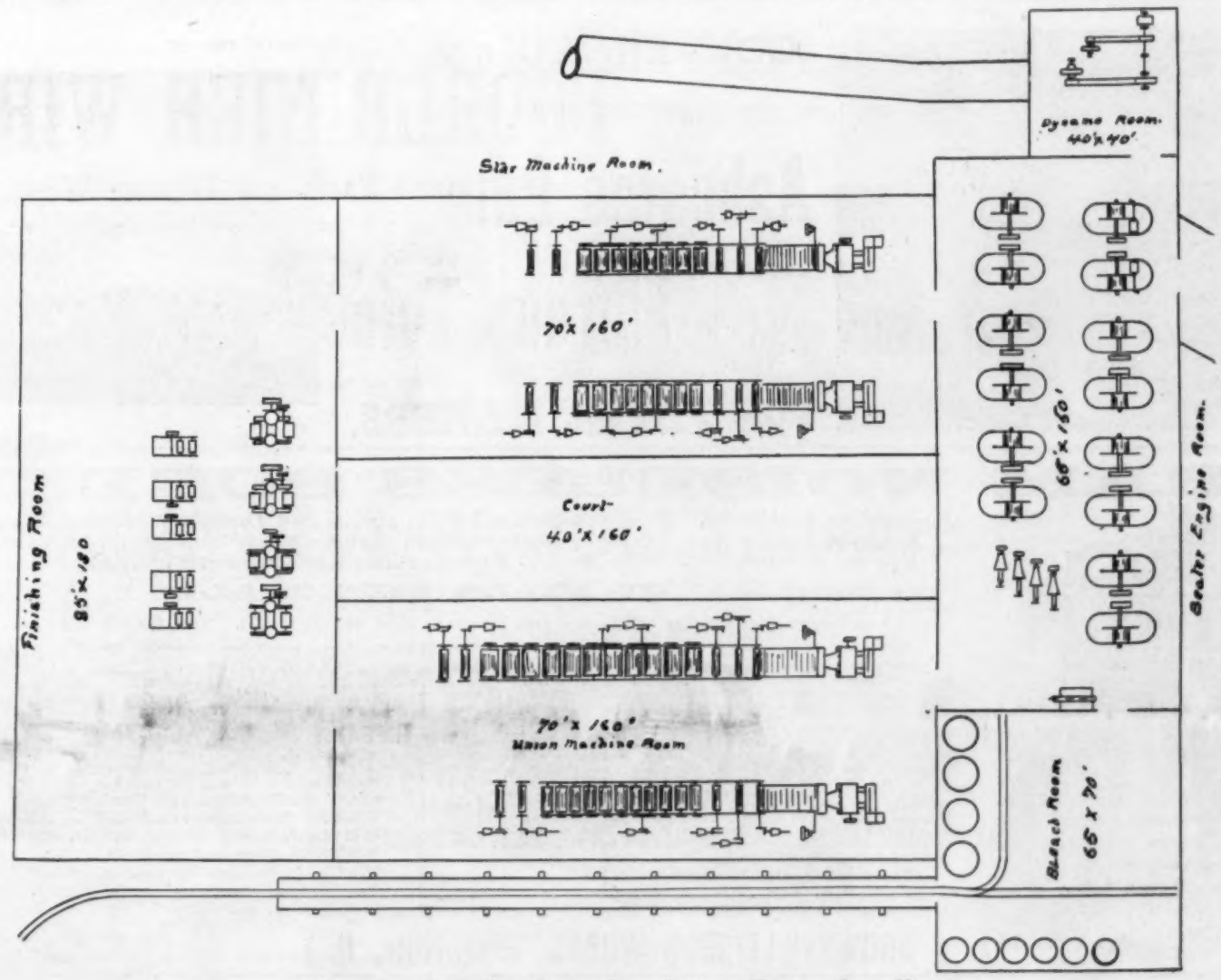
The Poland Paper Company's New Mill at Mechanic Falls, Me.

The new mill of the Poland Paper Company at Mechanic Falls, Me., just about completed, is a model in compactness and well arranged for the easy handling of stock and materials and their economical conversion into the finished product.

The plans were drawn by Edward A. Buss, of Boston, a mill architect and engineer of large experience, under whose supervision the big paper mill of the Hollingsworth & Whitney Company at Waterville, Me., was planned and erected.

The first brick of the Poland Paper Company's new mill was laid on July 11, 1893, and the building has progressed to completion without serious interruption or accident.

In the accompanying illustration is shown the plan of the mill, giving the location of



PLAN OF NEW PAPER MILL—POLAND PAPER COMPANY, MECHANIC FALLS, ME.

the beaters, the paper machines, the bleach tanks, the power room and the finishing room.

The main building, which is a solid brick structure, covers an area of 180 feet by 320 feet and removed some little distance are other buildings, such as boiler house, blacksmith shop, machine shop and carpenter shop, each well supplied with tools and appliances necessary to do the work incident to a paper mill.

The bleach room, situated in one corner, contains four large bleach tanks and six liquor tanks, and from this room runs a narrow gauge track to the railroad siding in front of the finishing room, where freight is received and paper shipped.

Opening out of the bleach room is a large and spacious beating engine room, 150 feet long and 65 feet wide. This room is supplied with fourteen Hollander beating engines of 1,000 pounds capacity each, and four Jordan engines. This room is well lighted by windows in the rear wall and in the monitor roof.

Connecting with this room is the dynamo room and the rag room, the latter being equipped with the necessary machines for dusting and cutting some 9 tons of stock per day, while in the basement below are nine large drainers of 20 tons capacity each.

The dynamo room, 40 by 40 feet in size, contains a 25 horse power Edison dynamo, which runs some 250 electric lights and gives power to the machine shop; and a Belknap dynamo, which drives two 50 horse power motors to run the supercalenders. All of the dynamos are run by water power.

The wheel house is just below the dynamo room, and is of the same size. The penstock shown in the plan is 520 feet long, 11 feet in diameter, and gives a head of 37 feet on the wheels—the three Hercules turbines, built by the Holyoke Machine Company, giving 1,400 horse power.

The basement is 16 feet high, and is studded with large brick piers, which give solidity to the floors above, and the space is well utilized. Close to the wheel house stands a large Knowles power pump with a throwing capacity of 33,000 gallons per hour, which furnishes all of the water required in the entire plant. A drainer room for chemical fibre is located in the basement, this room containing fourteen drainers, each having a capacity of 6,000 pounds. Ample storage room for chemicals, rags and fibres is also provided in the basement, and in locations which permit the easy handling of materials.

In the basement are located also the stuff chests. There are eight of these, each of 1,000 pounds capacity. They are the "Savage Perfecting" stuff chests, which are so strongly recommended by those having experience in their operation. These stuff chests require very little power to operate; they protect the stuff from dirt, prevent waste and thoroughly mix the stuff by a double agitation which moves it in different directions and prevents floating. The merits of the "Savage Perfecting" stuff chests being recognized by the Poland Paper Company, the company would place no other kind in its new mill.

The machine rooms, as will be seen from the plan, are separated by a spacious court, so that the walls on each side of the rooms admit of many windows, whereby plenty of light and good circulation of air is obtained.

These machine rooms are each 70 feet wide, 160 feet long and 17 feet high. Each room contains two paper machines. The sizes of the machines are: One 68 inch, one 86 inch, one 88 inch and one 90 inch, and each receives its stock from a Milliken screen.

Power for running the paper machine is furnished by four 72 inch boilers of 150 horse power each, built by the Portland Company, which concern also furnished the main line of shafting, pulleys and most of the iron work.

Connecting with the machine room is the finishing room. This room is very spacious, being 85 feet by 180 feet, well lighted by windows on three sides and by a monitor roof. Four calenders, four paper cutters and other necessary appliances make up the equipment of the finishing room.

From the finishing room all shipments are made, the freight cars running along the front of the building close to the platform which extends the entire length of the room, and is connected therewith by four large doors.

As will be observed the chief end sought was economy in the handling of material, and that end seems to have been accomplished. From the cars raw materials of all kind enter the mill just where wanted for use, and from one stage to another in the process of manufacture the materials are moved without loss of time or labor, from the initiatory stages of conversion to the finishing department, and then the paper marked with the name and address of the consignee goes into the car.

The product of the mill is book paper, machine finished and supercalendered, the daily output when the four machines are running being twenty-five tons.

Oil Fuel.

Americans are well situated as regards liquid fuel with their large sources of petroleum, and have had a most valuable experience in the use of it at the World's Fair, though there may be disputes as to whether it was cheaper than coal in actual money cost. Not much has been done in England in the use of liquid fuel, but some progress has been made, especially upon the Great Eastern Railway, in which there are now running quite a considerable number of locomotives the chief fuel of which is liquid, and usually a mixture of gas tar and distillation residuals.

In Russia, near the Caspian oil fields, the locomotives have long been fired by petroleum entirely, the fire box containing a lot of more or less cellular fire brick, but in England where liquid fuel might become scarce or the price might be put up, it has been designed to be used in a combination furnace, which differs in nothing from an ordinary locomotive deep fire box excepting in having a couple of 5-inch tubes put through the back fire box plate into the fire box at a height of a few inches above the fire grate surface. In each hole an atomizer injector is placed that blows the liquid fuel by steam into the furnace; and round the nose of the injector is a ring of pipe perforated in front which can be made to blow an annular stream of air into the furnace when needed. As a rule, this extra air is needed to complete the combustion of the oil, and the point of perfect combustion can be told by watching the chimney, which pours out colorless gas only when sufficient air is blown in. A light fire of coal and chalk is maintained on the grate; this ignites the oil as it is injected.

Both of the injector regulators are carried upon one fixing, and this fixing can be dropped and raised again by a single movement of another lever, whereby all supply of fuel is instantly stopped and as instantly put on again, exactly as before. Stopping at a station does not therefore affect the regulation of the combustion. This is stopped for economy when the engine stands, and yet no trouble is involved in restarting owing to the above excellent device. On account of the ease with which the expenditure of heat can thus be checked it is found that the liquid fuel gives a useful percentage effect per pound higher than is got from coal. The theoretical value of liquid fuel is about 75 per cent. above coal. Its practical value is about double.

I have noticed when running on a liquid fuel locomotive that the fire box seems completely full of white flame, and that with a heavy train steam could any time be made to blow at the safety valve, as though the ordinary proportions of furnace necessary for coal were too great for liquid. Considerable of the increased efficiency of liquid fuel may arise from the clean state of the tubes. The injectors point toward the lower part of the fire box back, and of course spray the oil upward upon the brick arch and downward on the thin bed of fuel on the grates. With this arrangement of furnace coal can be instantly resorted to in event of liquid running short, or an engine could run its out journey on coal and run its home journey with oil on the remnants of its coal fire. An advantage of the compound system is that the small amount of solid fire may be the lighting up fire. Of course the solid fire burns away and needs an occasional shovel of coal to keep itself incandescent, but it can be run very dirty and is largely chalk. A locomotive is of course a peculiar service, irregular and intermittent and something is therefore required to effect ignition after a stoppage. For more continuous working, I do not see why—when the supply of liquid is assured—there need be any solid fire.

On the locomotives to which I refer the oil is supplied, at most, heated by a steam coil, which is provided in the oil tank, simply to add heat to give the oil the necessary fluidity, but there appears good reason to expect that if the oil could be very considerably heated before it is sprayed, its combustion would be still more perfect. It appeared to me probable, referring to one of the questions for topical discussion at the Montreal meeting of the A. S. M. E., that it would usually only be requisite to regulate the fuel supply and the over-fire air supply, leaving the ash pit damper at one position throughout. There is perhaps always some air required to be put in above the bar surface, and this requires increasing with increase of fuel, and the only air necessary through the grate in the compound system is that to burn the solid fuel on the grate, and such liquid as falls in the form of liquid upon the solid fuel.

I have no experience in oil burning on any other system, except of observation of the Wells' and similar lights. The combustion of oil seems to be very perfect in a short time, wherein it differs from bituminous coal, and this is a special feature in oil of which makers of water tube and coil boilers ought not to be slow in taking advantage. I am no believer in boilers that have a small water capacity any more than I am in engines without fly wheels, for my experience is that boilers of small capacity are unsteady steamers, and liable to prime. If a sudden big call is made for steam from a large shell boiler, this can be responded to by a small drop of pressure while the fire is being gotten up, and similarly, when the demand for steam is over, the water will absorb the heat of the now active furnace with a moderate addition of pressure. Now, with oil firing an instant's time and a turn of a hand wheel will put the furnace into its fullest activity, or reduce it to its smallest dimensions to suit the demand for steam, and certain other defects of those boilers would be less felt with oil as fuel than with coal.

The instantaneous regulation of the turning effort on a steam engine crank would reduce the necessity for great weight of flywheel, and in the same way the quick response of the furnace makes it possible to reduce the water capacity of a boiler to such limits as the circulation of water and disengagement of the entrained steam may permit. For naval purposes weight or the want of it is so important that a coil boiler of light tubes will be preferred for torpedo boats, but unless great care be taken to prevent corrosion the giving way of a single tube may show that even lightness could be bought too dearly.—*W. H. Booth in American Machinist.*

General Notes.

W. H. Whittaker, 259 Front street, New York, offers clays, colors, &c., for paper makers' use. He also manufactures the "V. & A. Cold Water Paint," a durable, cheap and efficient material for the interior finish of mills, warehouses and dwellings.

Travelers find unexcelled accommodation and supreme comfort on the cars of the New York Central Railroad. American railways are noted for the advantages which they afford the traveling public, and there are none which surpass this splendidly equipped road.

The Ajax Metal Company, Philadelphia, Pa., has issued a special notice of a change in price of its "Ajax Tin." This material is a superior metal for journals running at high speed and carrying heavy loads. It is also a superior composition for castings which come in contact with steam, chemicals, &c.

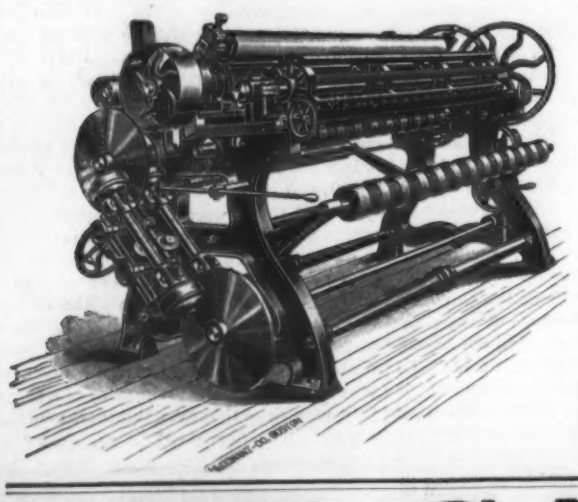
Bowman, Thompson & Co., Limited, Northwich, England, are said to be the largest individual producers of high test hard wood bleach in the world. Their "Rudder" brand is readily taken by consumers at prices equivalent to the best. Their American office is located at 66 Broad street, New York.

Alonzo J. Whiteman, who was recently arrested in Detroit, Mich., on a charge of passing a forged draft, has been discharged, the alleged forged signature being proven genuine. Mr. Whiteman was at one time in the paper trade, being the founder of the Whiteman Pulp and Paper Company, Dansville, N. Y., the predecessor of the Dansville Pulp and Paper Mill.

Charles F. Watson brought suit against the New York *Times* Publishing Company to compel the return to him of $10,000, the amount of his subscription to that corporation, claiming that misrepresentation had been made in regard to its stock. B. F. Einstein, counsel for the *Times*, entered a demurrer showing that there was no ground for action. Lord, Day & Lord, in behalf of the complainant, moved to strike out the demurrer on the ground that it was frivolous. The motion came up for argument on Thursday before Judge Barrett in the Supreme Court. Judge Barrett denied the motion.

A circular has been issued by John H. Davis & Co., 10 Wall street, New York city, requesting the bondholders of the United States Book Company to take part in a plan of reorganization. It is proposed to assess the bondholders 7 per cent., which on the entire million would give a working fund of $70,000; they would then receive 5 per cent. bonds of a new corporation to be organized to take over the plates and continue the publishing business. The bondholders are asked to give a power of attorney to a committee consisting of John Kean, Jr., George M. Hard and Jennings S. Cox, who will make the necessary arrangements for carrying on the business or select some suitable person to do so.

Two weeks ago it was announced that William Campbell & Co., manufacturers of wall paper, had sold out to the National Wall Paper Company. The fact was that they had agreed to sell, that a check for $25,000 to bind the bargain had been passed and that the contract was to be signed a few days ago. It was not signed, however, for at the time the purchaser wished Mr. Campbell to agree that Messrs. Jackson and Huppuch, who had been in his employ, would join the trust and would not go into business for themselves. Mr. Campbell said that was beyond his power, and the negotiations came to an end. The check was returned and receipted for, and now William Campbell & Co. are again on an independent footing. The firm has made arrangements for rebuilding its large factory on Forty-second street, between Tenth and Eleventh avenues, New York, which was burned last fall. The plant will cost nearly $500,000, and will have a front of 100 feet on Forty-second street and be eight stories high. The building will run back 200 feet to Forty-first street. It will have an L 100 feet long on Forty-first street, 50 feet deep and seven stories high, making a frontage of 200 feet on that street. The front on Forty-second street will be surmounted by a tall tower with a large clock, which will be illuminated at night.



THE "HORNE" FRICTION CUTTER

IS IN ADVANCE OF ANY CUTTER IN USE TO-DAY.

WE HAVE EIGHT RUNNING IN ONE FINISHING ROOM.

AFTER USING ONE SEVEN MONTHS **A CUSTOMER SAYS:** *"You have the Perfect Cutter. We are sure it will save its cost in one year in the saving of waste paper alone."*

THE J. H. HORNE & SONS CO., LAWRENCE, MASS., U. S. A.,
MANUFACTURERS OF PAPER MILL MACHINERY.

THE GARDNER PULP CO.,

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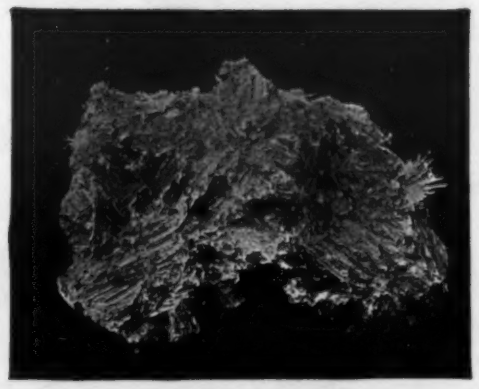
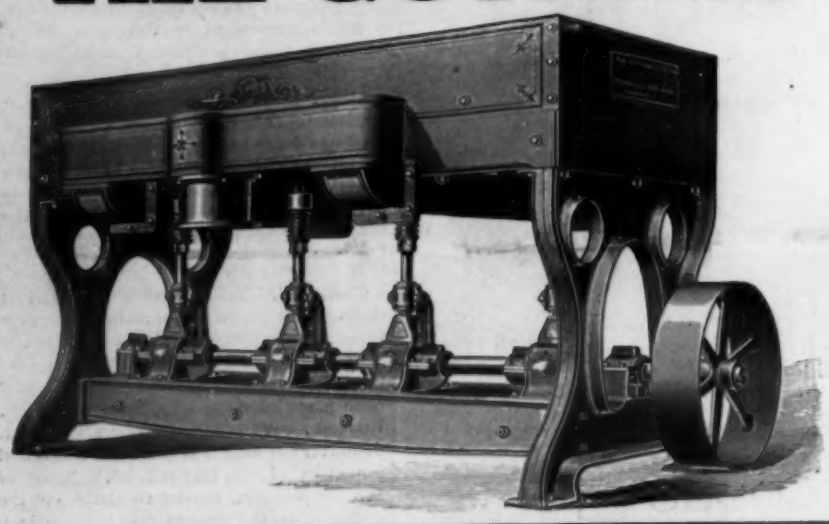
MANUFACTURERS OF

Asbestos Pulp and Fibrous Talc

FOR PAPER MAKERS.



THE GOTHAM NOISELESS SCREEN.



Screen Plates Stationary. No Accumulations to form Strings and Lumps. Runs at a Slow Speed—150 Revolutions per Minute. Variable Stroke in Blast. The Up Stroke is Double the Speed and of One-Half the Duration of the Down Stroke. A Quick, Forcible Blast Up, with a Slow Suction Down.

IT FILLS THE BILL!

First Screen made October 1, 1891, and used constantly since without repairs. Read the record for two years.

USERS:

NEW YORK—Empire Pulp Co., Black River, 1; Globe Paper Co., Brownville, 1; Union Pulp Co., Carthage, 1; Frontenac Paper Co., Dexter, 1; Leonard & Gilmore, Dexter, 1; Watterson Paper Co., Brownville, 3; Oswego Falls Pulp Co., Fulton, 3; Gouverneur Wood Pulp Co., Gouverneur, 4, two orders; Knowlton Paper Co., Watertown, 1; Ontario Paper Co., Watertown, 1; Herkimer Paper Co., Lyons Falls, 3 orders; G. R. P. Gould, Lyons Falls, 1; Gould Paper Co., Port Leyden, 1; Becquette River Pulp Co., Colton, 3; Estate of Richard Carter, Glendale, 1; Charles Wackerhagen, Canaan Four Corners, 1; Smeallie, Phillips & Co., Amsterdam, 1; O. E. Martin, Norwood, 1; Jefferson Paper Co., Black River, 1; St. Lawrence Paper Co., Dexter, 3; Payne & Blinn, Chatham, 1; M. M. Pillsbury, Napanock, 1; Victoria Paper Co., Fulton, 3 orders; Niagara Falls Paper Co., Niagara Falls, 16; Philip McGuire, Forestport, 1; Hartland Paper Co., Middleport, 1; Standard Pulp Co., Brown's Falls, 3; Fulton Paper Co., Fulton, 2, two orders; High Falls Sulphite Pulp Co., Potsdam, 4; Watertown Paper Co., Watertown, 1; Lewis, Slocum & Lefevre, Beaver Falls, 2.

NEW JERSEY—Sparks Manufacturing Co., 1.

MASSACHUSETTS—Chas. Callender, Glendale, 2; Merrimac Paper Co., Lawrence, 2; Connecticut River Paper Co., Holyoke, 1; Carew Manufacturing Co., South Hadley Falls, 1; Rice, Barton & Fales, Worcester, 3, two orders; Eaton, Dikeman & Co., Lee, 1; Bacon Paper Co., Lawrence, 1.

VERMONT—Fall Mountain Paper Co., Bellows Falls, 5 orders; Wymas, Flint & Sons, Bellows Falls, 2; National Metal Edge Box Co., Readsboro, 1.

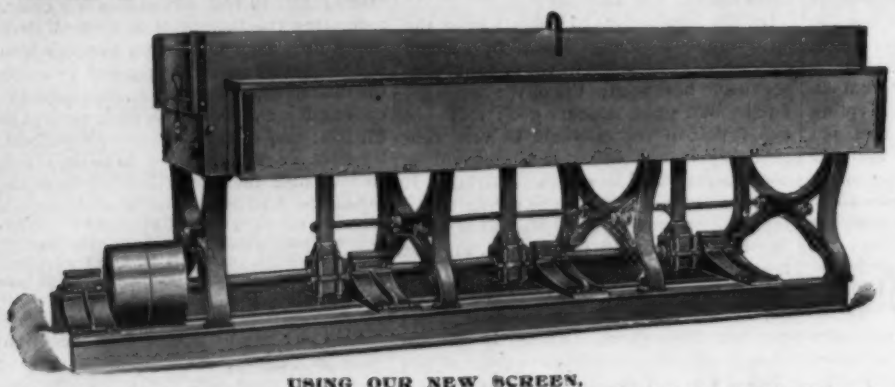
NEW HAMPSHIRE—Glen Manufacturing Co., Berlin Falls, 3; Sugar River Paper Co., Claremont, 1; Wilder & Co., Ashland, 1.

MAINE—Umbagog Pulp Co., Livermore Falls, 2; Bangor Paper Co., Orono, 4; Jay Paper Co., Jay, 1; Rumford Falls Paper Co., Rumford Falls, 29; Rollingsworth & Whitney, Gardiner, 1.

CONNECTICUT—White & Wells, Waterbury, 1.
VIRGINIA—Columbia Paper Co., Buena Vista, 2.
INDIANA—Anderson Paper Co., Anderson, 3.
WISCONSIN—Kaukauna Paper Co., Kaukauna, 1,
MINNESOTA—St. Cloud Paper Co., St. Cloud, 1.
MICHIGAN—Alpena Sulphite Fibre Co., Alpena, 2.
TENNESSEE—Tennessee Fibre Co., Memphis, 1.

BROWNVILLE IRON WORKS, Brownville, N. Y. ALSO MANUFACTURERS OF Wet Machines, Centrifugal Pumps, &c.

TICONDEROGA MACHINE CO., TICONDEROGA, N. Y.



USING OUR NEW SCREEN.

Glen Manufacturing Co., Berlin Falls, N. H., 13; Barclay Fibre Co., Sangerties, N. Y., 5; Katahdin Pulp and Paper Co., Lincoln, Me., 10; Haverhill Paper Co., Haverhill, Mass., 2; The J. & J. Rogers Co., Ausable Forks, N. Y., 10; New York and Pennsylvania Co., Johnsonburg, Pa., 1; H. J. Roberts, Birmingham, Conn., 1; Ticonderoga Pulp and Paper Co., Ticonderoga, N. Y., 4; Piscataquis Falls Pulp and Paper Co., Enfield, Me., 2

USING OUR OLD SCREEN.

Piscataquis Falls Pulp and Paper Co., Enfield, Me., 12; Howland Falls Pulp Co., Howland, Me., 10; Penobscot Chemical Fibre Co., Great Works, Me., 4; Willamette Pulp and Paper Co., Oregon City, Ore., 1; Bangor Pulp and Paper Co., Basin Mills, Me., 2; Kane's Falls Pulp Co., Fort Ann, N. Y., 2; Westmoreland Paper Co., West Newton, Pa., 6; Dexter Sulphite Pulp and Paper Co., Dexter, N. Y., 3; Otis Falls Pulp Co., Livermore Falls, Me., 3; Michigan Sulphite Co., Port Huron, Mich., 2; Singerly Pulp and Paper Co., Singerly, Md., 1; Ticonderoga Pulp and Paper Co., Ticonderoga, N. Y., 7.

USING OUR BARKERS.

The J. & J. Rogers Co., Ausable Forks, N. Y., 4; Katahdin Pulp and Paper Co., Lincoln, Me., 4; High Falls Sulphite Pulp and Mining Co., Potsdam, N. Y., 2; Glen Manufacturing Co., Berlin Falls, N. H., 4; Oswego Falls Pulp and Paper Co., Fulton, N. Y., 1; Treadwells Mills Pulp and Paper Co., Plattsburgh, N. Y., 3; Shenandoah Pulp Co., Harper's Ferry, W. Va., 3; Miller Bros. & Co., Glen Miller, Ont., Canada, 1; Piscataquis Falls Pulp and Paper Co., Enfield, Me., 6; Kane's Falls Pulp Co., Fort Ann, N. Y., 1; Manufacturing Investment Co., Madison, Me., 9; Umbagog Pulp Co., Livermore Falls, Me., 2; Moosehead Pulp and Paper Co., Solon, Me., 1; Bennington Falls Pulp Co., Middle Falls, N. Y., 1; Saranac River Pulp and Paper Co., Cadyville, N. Y., 1; Smith & Martin, Plattsburgh, N. Y., 1; Otis Falls Pulp Co., Livermore Falls, Me., 1; Hollingsworth & Whitney Co., Waterville, Me., 3; Gilbert & Bell, Waterford, N. Y., 1; Laurentide Pulp Co., Montreal, Canada, 1; Hudson River Pulp and Paper Co., Palmer's Falls, N. Y., 1; Battenkill Paper Co., Greenwich, N. Y., 1; Ticonderoga Pulp and Paper Co., Ticonderoga, N. Y., 1.

MANUFACTURERS OF

COMPOUND AUTOMATIC HIGH SPEED STEAM ENGINES, PAPER MILL AND POWER TRANSMITTING MACHINERY.

SEND FOR CATALOGUE AND BLUE PRINTS.

WE LEAD, AND OTHERS FOLLOW! Over 200 "SUCCESS" Screens in use on all kinds of stock.

"THE SUCCESS" LEADS THEM ALL.

READ THE FOLLOWING LIST OF USERS AND BE CONVINCED:

The Glens Falls Paper Mill Co., Glens Falls and Fort Edward, N. Y.	**91**	Agawam Paper Co., Mittineague, Mass.	1	Wilder & Co., Olcott Falls, Vt.	3
The Hudson River Pulp and Paper Co., Palmer's Falls, N. Y.	**50**	The Worthy Paper Co., Mittineague, Mass.	1	Syms & Dudley Paper Co., Watervliet, Mich.	2
The Burgess Sulphite Fibre Co., Berlin Falls, N. Y.	12	Chester Paper Co., Huntington, Mass.	1	The Little Chute Pulp Co., Little Chute, Wis.	6
Marinette and Menominee Paper Co., Marinette, Wis.	8	Bayless Paper Co., Binghamton, N. Y.	2	Niagara Falls Pulp and Paper Co., Niagara Falls N. Y.	1
Combined Locks Paper Co., Combined Locks, Wis.	4	Wagman & Thorp Co., Fort Miller, N. Y.	2	Kimberly & Clark Co., Kimberly, Wis.	3
Wilkinson Bros. & Co., Derby, Conn.	5	Moore & Thompson Paper Co., Bellows Falls, Vt.	1	Atlas Paper Co., Appleton, Wis.	1
Sandy Hill Power and Pulp Co., Sandy Hill, N. Y.	4	Allen Bros. Co., Sandy Hill, N. Y.	1	Shattuck & Babcock Co., De Pere, Wis.	2
The Riverside Paper Co., Holyoke, Mass.	**4**	Hudson River Water Power and Paper Co., Mechanicsville, N. Y.	1	The Wanaque River Pulp and Paper Co., Wanaque, N. J.	2
The Holyoke Paper Co., Holyoke, Mass.	1	Ohio Paper Co., Niles, Mich.	1	Nekoosa Paper Co., Nekoosa, Wis.	7
Franklin Paper Co., Holyoke, Mass.	1	Otis Falls Paper Co., Livermore Falls, Me.	19	Niagara Falls Paper Co., Niagara Falls, N. Y.	2
Chemical Paper Co., Holyoke, Mass.	2	J. D. Mulrenan, Hadley, N. Y.	2	The Maritime Sulphite Fibre Co., Chatham, New Brunswick, Canada	4
Beebe & Holbrook Co., Holyoke, Mass.	2	Saranac River Pulp and Paper Co., Cadyville, N. Y.	2	The Uncas Paper Co., Norwich, Conn.	1
A. H. Hubbard Co., Norwich, Conn.	2	Herkimer Paper Co., Herkimer, N. Y.	3	Sandy Hill Pulp Co., Sandy Hill, N. Y.	1
		Winnipisiogee Paper Co., Franklin, N. H.	2	Kimberly & Clark Co., Neenah, Wis.	2
		Jas. Ramage Paper Co., Monroe Bridge, Mass.	1		

MADE IN THREE SIZES: SIX, EIGHT AND TEN PLATES.

Wood Pulp Grinders, Improved Patterns.
Wet Machines, Improved Patterns.
Friction Pulleys and Couplings.

OTHER SPECIALTIES:

Double and Single Stuff Pumps, Improved Patterns.
Soft Steel Slitters, Improved Patterns.
Wood Chippers.

FRICTION PULLEY AND MACHINE WORKS, SANDY HILL, N. Y.,

SOLE MANUFACTURERS OF THE "SUCCESS" SCREEN.

Electricity and Water Wheels.

There is no doubt that the growing use of electricity will in the end, says the *American Machinist*, materially help the trade in water wheels, which has been rather hardly pushed by the steam engine. Water powers are being, and will be turned to account which would remain dormant only for electrical distribution of power. Where mills and factories cannot be well located the energy of the falling water may be taken by electricity to convenient positions, and to some extent this is being and will be done. This will, however, cut only a small figure in the manufacture and sale of steam engines—probably not enough of a figure ever to be noticeable. It will in some instances provide for locating shops and factories which would not otherwise be built, and provide for the lighting of places which would otherwise grovel in the darkness of gas or oil lamps. Electricity will help the water wheel without to any appreciable extent injuring the steam engine.

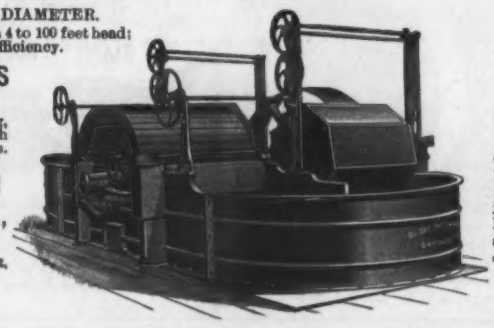
The sections of large fly wheels are held together by bolts, keys, links and analogous means, and should be regularly inspected to see that none of the fastenings are loose. In one instance a wheel 25 feet in diameter with a peripheral velocity of 5,283 feet per minute ran for some years quite open to inspection. It was then closely boxed in, and in about a year went to pieces, doing considerable damage to the mill, but fortunately injuring no one. It was always believed that the accident was caused from some of the fastenings getting loose.

NEW AMERICAN TURBINE.

FROM SIX TO SIXTY-SIX INCHES DIAMETER.
Are in practical operation under heads from 4 to 100 feet head; are strong, durable and give high efficiency.

BEATING ENGINES
Cast Iron or Wood Tubs.
Made heavy and strong, double lightered, with well made Cone Washers.

DAYTON GLOBE IRON WORKS CO.,
Successors to STOUT, MILLS & TEMPLE,
Dayton, Ohio, U. S. A.



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WOOD PULP GRINDER
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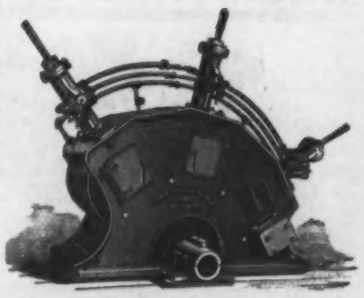

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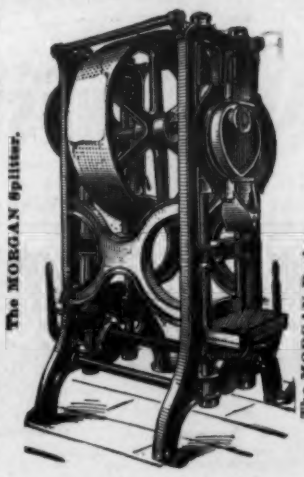

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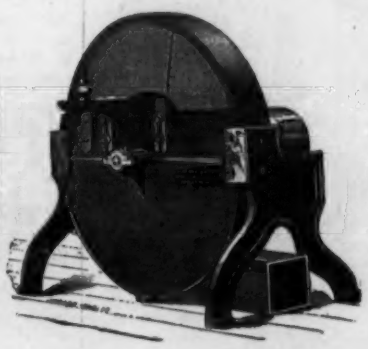

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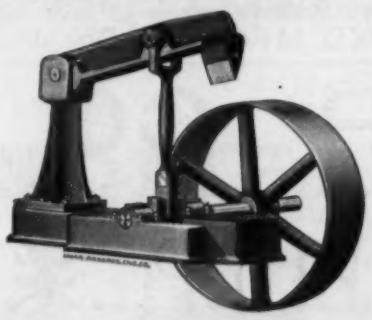

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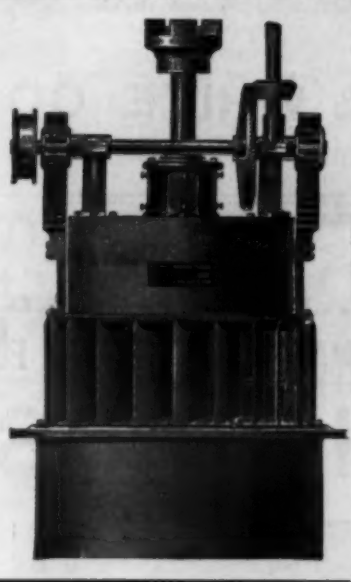

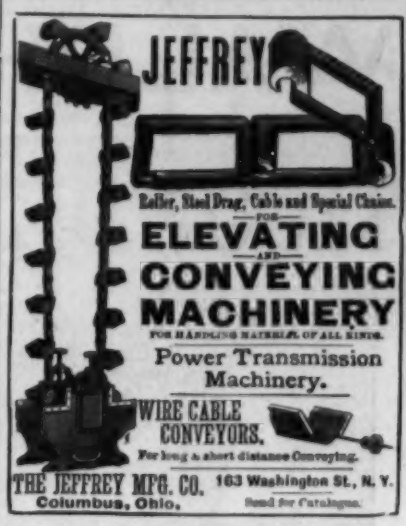
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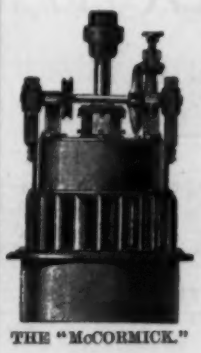

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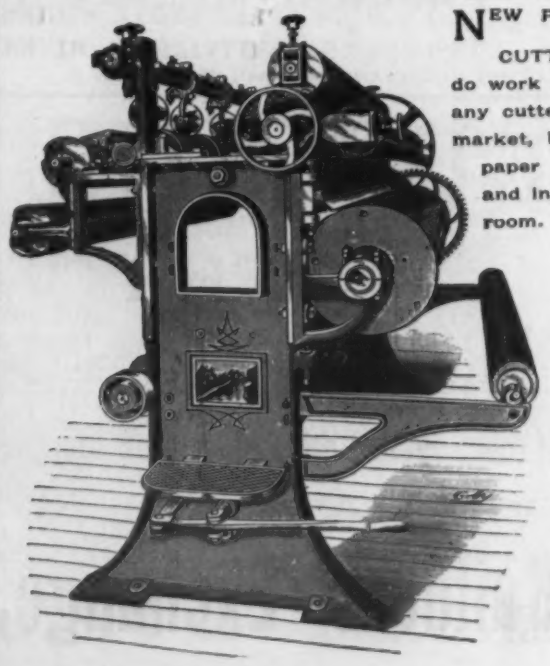

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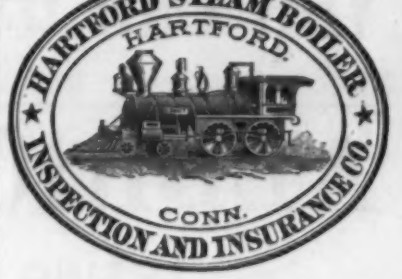

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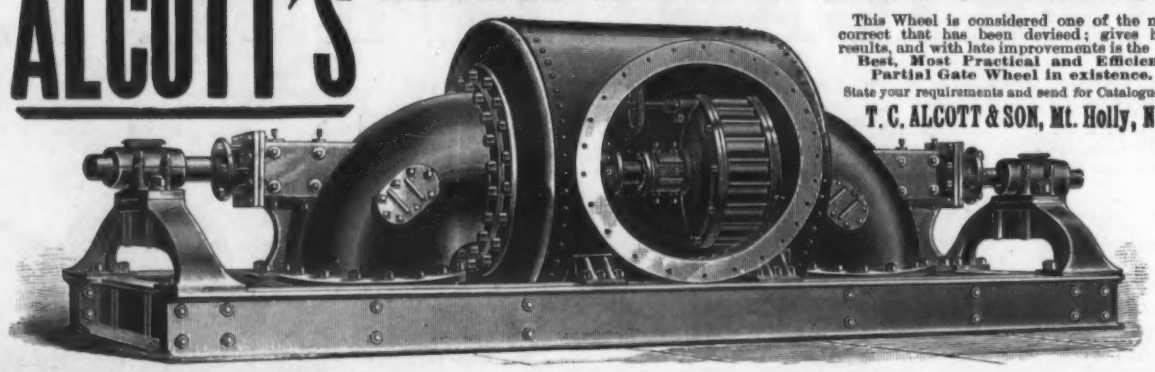

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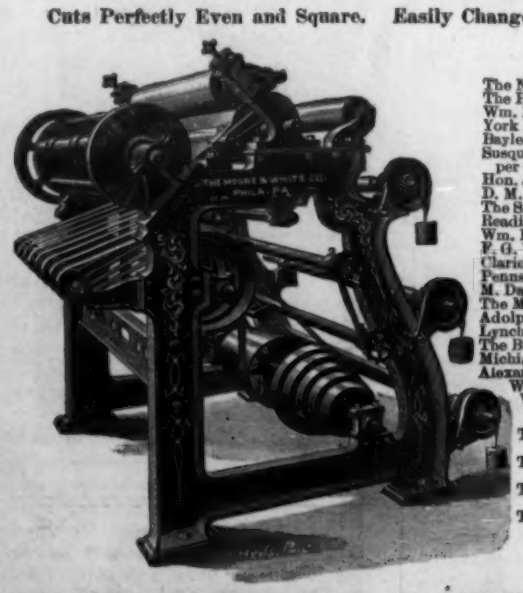

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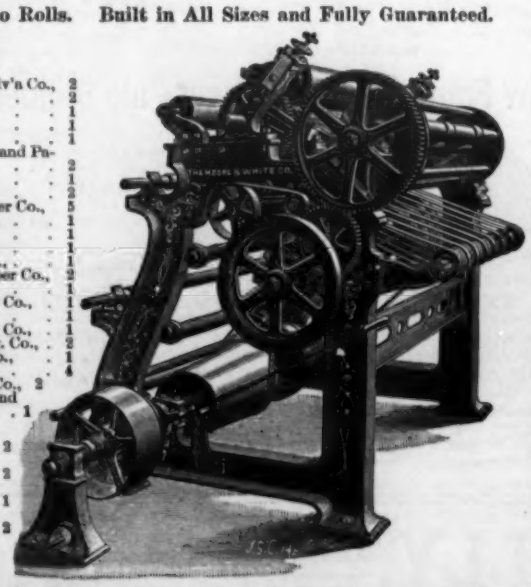

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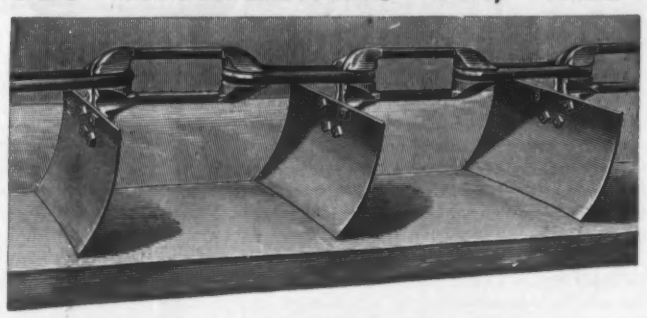

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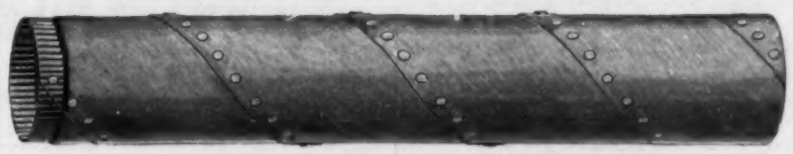

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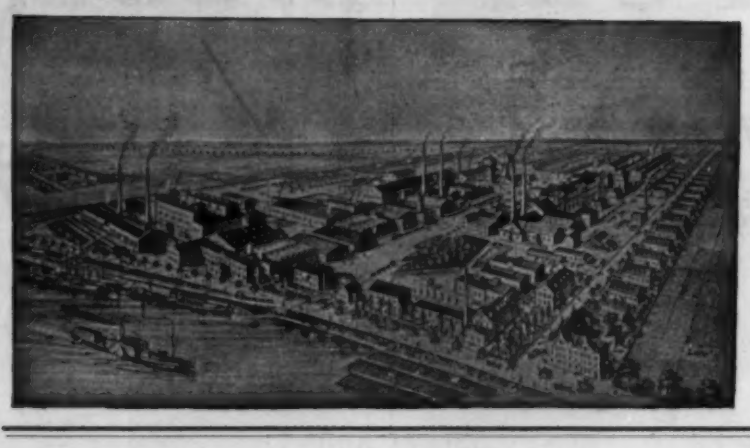

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By Charles Richards Dodge.*

THE MALVACEOUS FIBRES.

(Continued.)

The Foreign Species of Hibiscus.

Hibiscus splendens (Hollyhock tree).—Fibre from this species, a native of Queensland and New South Wales, is exhibited in the museum of the department, prepared by Dr. W. R. Guilfoyle, director of the Melbourne Botanic Gardens, who states that the species is a splendid tree, growing to the height of 20 feet or more. "It is very pubescent, bearing large pink flowers resembling hollyhocks in size and appearance." The fibre is suitable for cordage, fish lines, paper, &c. Fibre of *Hibiscus sorbifolia* and *mutabilis* was also received from Dr. Guilfoyle, through the exhibition of 1876. Both of these species are indigenous in Queensland. *H. mutabilis* is a native of China, but grows in India and other eastern localities. Fibre of *H. Tetracus* was also received with the above, but does not differ materially.

The *Mahoe* or *Mahaut*, *H. arboreus*, of the West Indies, grows to a height of 16 to 20 feet, and its bark furnishes a superior fibre, which, according to Squier, "is not at all inferior to hemp for most purposes." The fibre is naturally soft and white, and is admirable for the manufacture of paper. *H. elatus*, of the West Indies, is employed in making cigarette wrappers. It is a tree that grows to the height of 60 to 80 feet. *Hibiscus tiliaceus* is worthy of passing mention. It is called *majagua* in Central America and the West Indies, where it is much used for cordage. It is little affected by moisture, and is therefore selected by surveyors for measuring lines. It is the *Bola* of Bengal, and is found throughout tropical and subtropical regions of both continents. The native method of preparing the fibre when a rope or piece of cordage is wanted is to strip the bark from a branch, then, holding one end firmly between the toes, first tearing it in strips, it is twisted by the hands. "It was generally cultivated in America prior to 1492." Beautiful examples of this fibre were shown in the Costa Rican exhibit in Chicago, 1893. There are other species growing in different portions of the world, the fibre of many of which is employed in native manufacture.

*Report to U. S. Department of Agriculture.

OKRA FIBRE.

The okra has long been regarded as a fibre plant of value in India and other countries, though the production of its fibre has never assumed commercial importance. The plant is a native of the West Indies, but it has found a home in southern portions of the United States, where it is grown for its pods, which form a useful article in the domestic economy. It is also cultivated in South American countries, as well as in countries of the Old World, the French estimating it highly as a food plant. In France it is known as *gombo*, and it is the "gumbo" of Louisiana, which is employed in a number of Creole dishes, the best known being "gumbo soup."

The plant is a true Hibiscus, the entire family of the *Malvaceæ* furnishing in the bast of their stalks a fibre which in the absence of jute and hemp might be employed in the arts for cordage, bagging and other coarse manufactures. When cultivated for its pods alone the okra plants are grown at considerable distance from each other, and the strength of the plant goes to develop leaves and fruit; but if cultivated for fibre the seeds should be sown thickly and the plants cultivated closer together, that the stems may grow tall and straight and the bark smooth and better adapted to the production of fibre.

A few years ago okra attracted considerable attention as a possible fibre for Southern cultivation, and a large correspondence with the department resulted, and many articles on the subject appeared in the newspapers of the day. As is frequently the case, however, the value of the plant and the ease of its cultivation for fibre were very much overstated, and subsequent experiments did not substantiate the claims made for the plant.

In color okra fibre is as white as New Zealand flax, much lighter than jute as usually prepared for export, but more brittle and showing less strength. The filaments are smooth and lustrous and are tolerably regular.

Spon states that the fibre is long and silky and generally strong and pliant. When well prepared, as in portions of India, it is adapted for the manufacture of rope, twine, sacking and paper. In Bengal its fibre is reputed harsh and brittle, owing doubtless to improper treatment, and it is but little manufactured there. In Dacca and Mymensing it is used to adulterate jute. It resembles hemp, and under this name is exported to the amount of a few thousand hundred weight yearly. In France the manufacture of paper from this fibre is the subject of a patent; the fibre receives only mechanical treatment and affords a paper called *banda*, said to be equal to that made from pure rags.

Dr. Roxburgh experimented with okra many years ago in India, and made repeated tests of the strength of the fibre. In preparing the material for these tests, the stems were cut when the seed was ripe, and were steeped a few days before preparing. His tests, compared with hemp and jute, are thus recorded: The okra fibre, dry (from India), broke with a strain of 79 pounds; wet, 93 pounds; jute (*Corchorus olitorius*), dry, 113 pounds; wet, 125 pounds; hemp (Bengal), dry, 158 pounds; wet, 190 pounds. *Hibiscus cannabinus* in the same test gave, dry, 115 pounds; wet, 133 pounds. Other species of Hibiscus gave as follows: *H. sabdariffa*, dry, 93 pounds; wet, 117 pounds; *H. strictus* (from the Mollucas), dry, 104 pounds; wet, 115 pounds, and *H. furcatus*, dry and wet, 89 and 92 pounds respectively. It will be seen by these tests that okra fibre is not only inferior to that from other species of mallows, but is inferior to jute, and not half as strong as hemp.

A correspondent of the department, Mr. Felix Fremerey, makes the following statements of his experience regarding the cultivation of the plant for fibre:

The seeds are thickly sown on any rich soil about the beginning of April in the South, and by the beginning of May in the North, in drills 6 inches apart. The seeds can also be sown broadcast about 20 pounds to the acre; but here much care has to be taken to sow as uniformly as possible. In eighty or ninety days the stalks take a rosy color, and without irrigation they will then have attained a height of from 4½ to 5½ feet, while with irrigation during dry weather they will grow to a length of from 6 to 8 feet and even more. The stalks can then be cut with a mowing machine having a dropper attached 2 or 3 inches from the ground.

In cleaning the fibre Mr. Fremerey's plan was to strip the bark by means of a machine, after which it is steeped in stagnant water for five or six days, until the fibre is freed from epidermis and gummy matters. The product is then washed and dried.

In 1890 the Moss Collar, Bagging and Cordage Company, of Fort Worth, Tex., became interested in the fibre and issued a circular entitled "A Word to Farmers," which contained a lengthy account of the production of the fibre and its uses. It was hoped to make the culture of the fibre and its manufacture into bagging a success, in order to give a substitute for jute that would enable the farmers of the South to avoid paying tribute to the "jute trust." I quote a brief extract from this circular:

Okra is destined to become one of the most important fibre plants, for several reasons. It is the most easily prepared for market, and the processes are so simple that any farmer desiring to enter into the culture of the plant need not fear his chances of success. Machinery for decorticating and degumming is to be had at a far less price than machinery for the purpose of preparing cotton. The culture of the plant is as simple as that of corn or cotton. There need be no fear of lack of market for the fibre. It is as salable for cotton bagging, grain sacks, &c., as jute, and as suitable for rope and cordage as sisal and manilla. Binder twine can be made from it on the same machinery as that used for either of the above named fibres. Then again it can be used for the manufacture of many of the finer grades of goods, such as carpets, blankets, &c., and the shorter fibre is suitable for the manufacture of mattresses, horse collars, &c.

The company named in the circular offered to sell seed to the farmers at cost and purchase all the product "that could be carted to the mill." The department carried on a lengthy correspondence with Dr. M. Chambers, who was named in the circular, and was much interested in a machine he was constructing, which, however, was never perfected. A large area was planted in okra near Fort Worth, but the department was not able, subsequently to learn how much fibre was secured, if any, or to obtain samples of either fibre or stalks. Like many other such enterprises, the advantages of the culture were very much overstated, and the ratio of cost of production to yield and value of product doubtless appeared, in actual practice, inversely, compared with the golden promises made at the outset of the experience.

W. L. Van Duzor, another correspondent of the department, who has cultivated the plant in Florida, writes as follows:

There are two varieties grown here—the dwarf and the giant, or large—and both grow thriftily in our poorest pine land. The dwarf attains a height of 4 feet, and the pods are sufficiently matured for culinary use in three months from planting. The giant variety, and the one I should judge the most valuable for fibre, requires six months to mature, and attains a height of 15 to 18 feet and often lives more than one season. I have seen stalks of okra, two years old, full of tender, succulent pods, without a leaf upon the stalks. Not only will it grow from the seed almost without cultivation, but in this climate it will rattoon three years, the last crop nearly equal to the first, it being very rarely injured by frost. I am unable to say what the yield of stalks per acre would be, but I think I could safely say 15 tons.

A South Carolina correspondent, who had experimented with the plant for several years, suggested a novel means of avoiding the use of a machine in stripping the fibre. His plan is to allow the stalks to stand in the field until after frost, when the bast can be easily peeled by hand. The ribbons of stripped bark are then boiled out in water. A claim of 1,500 to 2,000 pounds of fibre per acre by this process is made, at a cost of 2 or 3 cents per pound. Such a plan is not advisable, however, as the fibre would doubtless lose in strength. Then such crude hand methods of harvesting could not be made to pay, where the fibre must be employed as a substitute for jute, with which it would compete.

Notwithstanding all that has been written upon the subject, and the experiments that have been carried out in different localities in an endeavor to establish the industry, the efforts have not been productive of satisfactory results.

Dr. C. F. Panknin, of Charleston, S. C., who planted a small area in okra, gave the results of his carefully conducted experiments as follows: A half acre of stalks was produced, one-half of which, when decorticated by his process, yielded at the rate of 180 pounds of fibre to the acre, the expense being in the neighborhood of $75. The fibre has been used experimentally in the manufacture of paper in Alabama.

From a careful consideration of the subject in all its details, not only as relates to our own but to other countries, and considering the weakness of the fibre compared with jute, I conclude that the cultivation of the okra plant for its fibre cannot be made a paying industry in the United States. And this opinion is emphasized by the fact that there are several species of indigenous fibre plants which could be as easily grown and which are superior to jute in strength, while India jute itself will do well in many of the Southern States.

(To be continued.)

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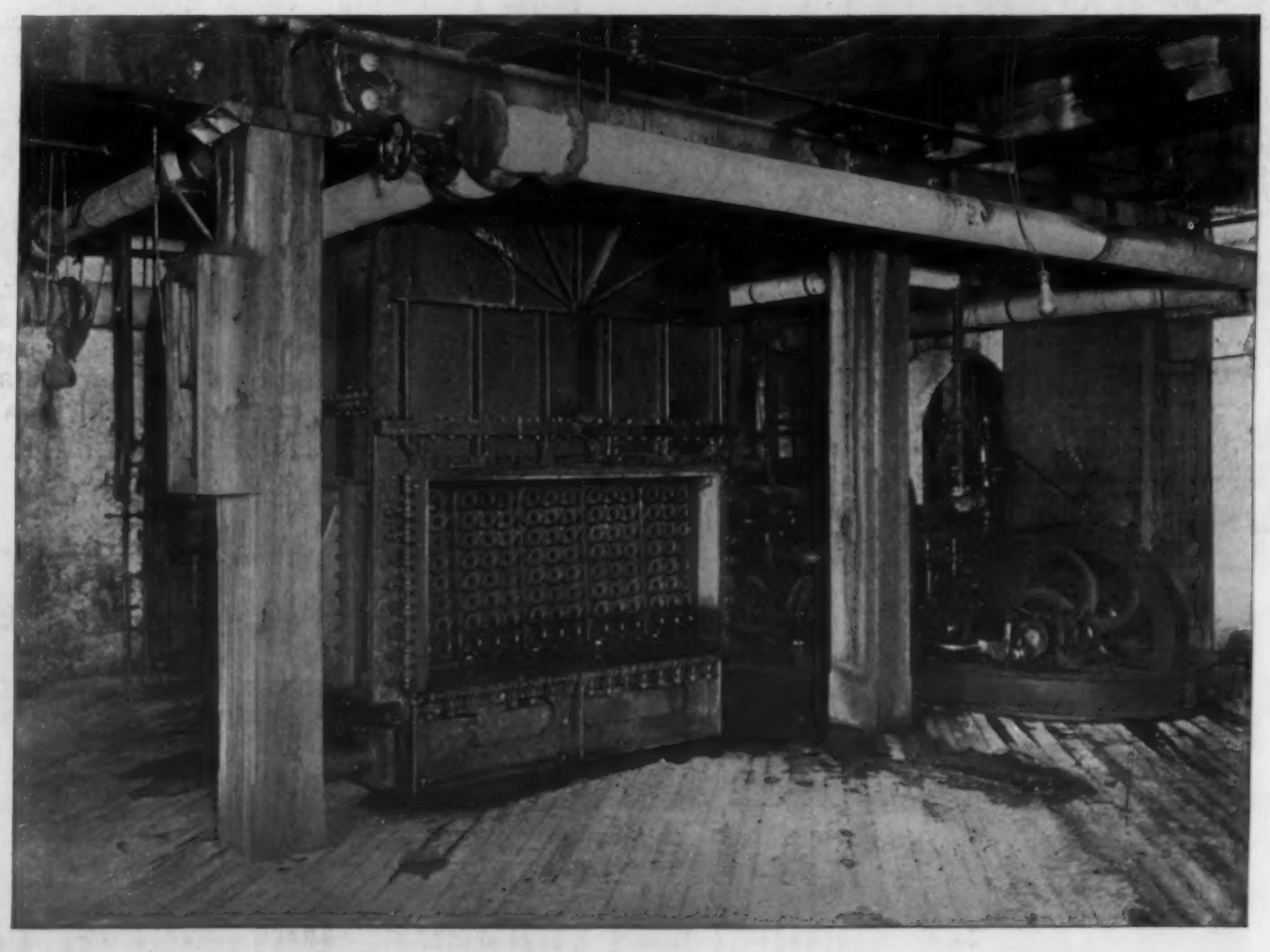

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PHILADELPHIA.

Electrolytic Decomposition Tank.

This invention is an improvement in tanks for the electrolytic decomposition of metallic salts. The vat or receptacle for containing the solution to be decomposed is made of iron or like metal, in order that it may serve also as the cathode of the couple. Within this vat is suspended a carbon anode, separated from the cathode by a mass of pulverized anthracite coal contained in a bag or other receptacle and packed in around the anode, the purpose of the coal

Fig. 1

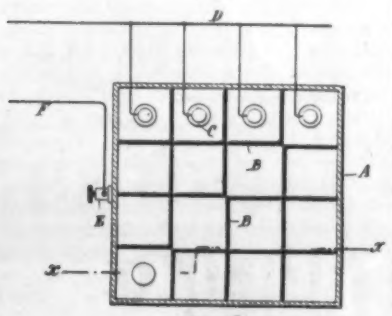
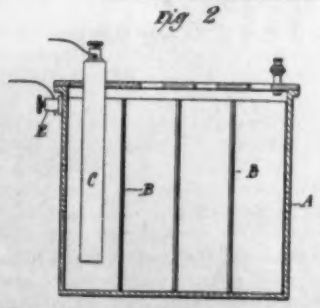


Fig 2



ELECTROLYTIC DECOMPOSITION TANK.

being to form an electrolytic diaphragm or partition between the two electrodes. Various other electrodes and many forms of electrolytic partitions may be used and different appliances and constructions adopted for carrying off the gases generated at the anode or acids resulting from impurities and chemical combinations in the coal dust; but the essential feature, so far as this invention is concerned, is the use in an apparatus of this kind of an anode in an iron cathode tank.

In practice it has been found convenient to employ a number of anodes in one large cathode tank, as the construction of a separate iron tank for each anode involves great expense and waste of material; but when a number of anodes are suspended or supported in one tank the distance between some of them and the walls of the tank increases the internal resistance of these couples to such an extent as to impair their efficiency. This is avoided by dividing up the interior space in the main tank into a number of vertical compartments by means of angle iron plates set on end. Each of such compartments contains an anode, and communication for the circulation of solution is maintained between all of them through the joints or spaces left between the several plates.

This improvement is shown in detail in the accompanying drawings.

Figure 1 is a plan view of the apparatus. Fig. 2 is a vertical section on line *x*—*x* of Fig. 1.

A is the usual cathode tank or vat, of iron or suitable material.

B, B are angle plates of the same material placed on end in any desired manner to divide the main tank or vat up into small compartments or cells. These plates are independent and preferably placed in the tank without connections—at least no permanent connections. For the outer compartments the main vat A forms, in part, the walls, while the walls of the inner compartments are composed entirely of the angle plates.

C, C are the anodes or bags containing the same. These are connected to one of the main wires D, while a binding post, E, on the tank A, serves to connect all of the cathode surfaces to the other wire F. This arrangement effects a great saving in material and cost, and makes available large rectangular tanks, which are the easiest and cheapest to make and most economical to use.

The Fuel Question.

SMALL SIZES OF COAL—METHODS OF BURNING—COMPARATIVE ECONOMY COMPARED WITH LARGE SIZES.

[WRITTEN FOR THE PAPER TRADE JOURNAL.]

BY JAMES F. HOBART.

In order to obtain the full value of the smaller sizes of coal it must be burned in a manner suited to its peculiarities. We know that the larger sizes of anthracite coal must be burned in a manner much different from that required for bituminous varieties, and that bituminous coal must be handled differently from wood, peat, tanbark, &c. In fact each and every variety of fuel has its peculiarities in burning, and to secure the best possible results we must study these differences and be able to humor each kind of fuel as its make-up requires. At present there are two methods of burning coal, one of which will apply to any kind, whether large or small, anthracite or bituminous. The two methods apply mainly to the air supply, and may be stated as follows: Natural, and forced draft.

NATURAL DRAFT.

Owing to the fineness of the fuel, natural draft is not particularly desirable when burning coal which packs tightly upon the grates. The finer the fuel the greater becomes the task of supplying the quantity of air necessary for complete and economical combustion. This is due partly to the fact that fine fuel lies very close upon the grate, thus reducing largely the air passages between the particles of fuel. Another obstruction to the entrance of air lies in the extremely small openings permissible in the grate, again reducing greatly the possible cross section of air passages through the grate. Only in exceptional cases will natural draft be found sufficient to give the necessary combustion per foot of grate surface per hour. Occasionally a plant may be found which has draft enough to burn pea coal without a blower. A textile factory in Pittsfield, Mass., occurs to the writer as an example, where there was at the time that a test was made a natural draft at the bottom of the stack of three-quarters of an inch of water pressure. Such pressures are exceptional, as stated, and as artificial draft usually has to be employed when burning small coal, no further attention will be given to burning such coals by natural draft.

According to R. J. Butler, experiments made by him (in England) showed that the requirements of the various points of two boilers were as follows:

Per square foot of grate surface: Natural draft, 10 to 10.87 horse power; steam blast, 12.5 to 13; forced or blast draft, 15 to 16.

Heating surface per horse power: Natural draft, 2 44 to 2.61; steam blast, 1.71 to 2.86; forced or blast draft, 1.56 to 2.5.

Tube surface per horse power in square feet: Natural draft, 2.03 to 2.18; steam blast, 2.02 to 2.08; forced or blast draft, 1.3 to 2.8.

Horse power per square foot of grate in these trials: Natural draft, 10.15 to 10.87; steam blast, 12.76 to 13.1; forced or blast draft, 10.6 to 16 9. The average of this last statement is as follows: Natural draft, 10.51; steam jet, 12.93; forced blast, 13.70; or only 0.77 horse power difference between the steam jet and forced blast combustion is shown. There is not much in favor of the blower over the steam jet. Some allowance must, however, be made for the type of boilers upon which the experiments were evidently made, for, in American practice, the Cornish boilers burn, the slowest, 4; ordinary, 10 pounds of coal per square foot of grate per hour; stationary, 10 to 16; marine, 16 to 24, while the quickest, giving complete combustion, is from 20 to 23 pounds of dry coal; for coking coal the quantity runs up to 24 to 27 pounds, and in the locomotive 40 to 120 pounds have been burned per square foot of grate surface.

The makers of the Sturtevant blowers publish a table which has been incorporated in engineers' reference books, as follows:

From this table it will be seen that for 20 square feet of grate 1,936 cubic feet of air per minute will be required, and 1.51 horse power will be required to drive this quantity of air through the grates. This point will be noted when the steam jet draft is discussed, which comes under the head of

FORCED DRAFT.

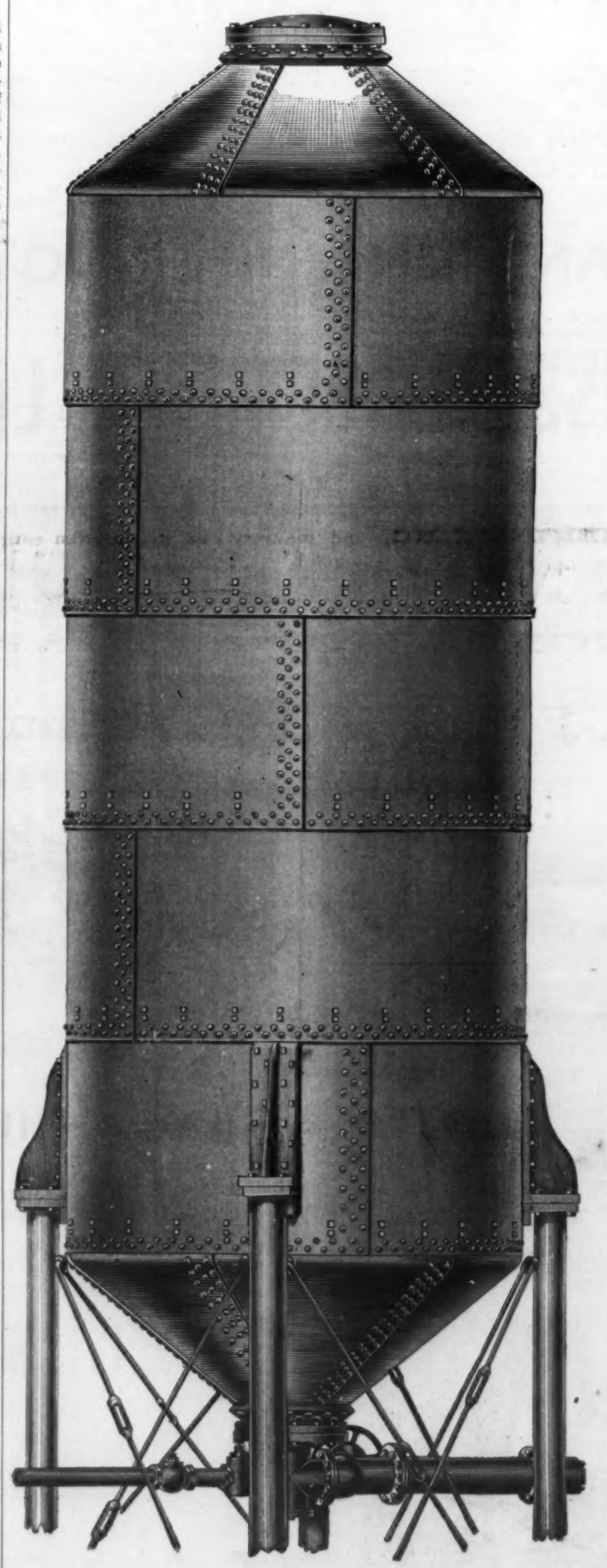
It is claimed that when a blower is used, giving a blast strong enough to furnish oxygen in sufficient quantity at the top of the fire to burn even a portion of the carbonic oxide produced by conversion, a vast quantity of nitrogen has also passed through the fire. The action of nitrogen in a fire is said to be that of a diluent, or an absorbent of heat, so that only a portion of the oxide formed in the fire can be reached by the oxygen in time to burn it. Thus the apparent gain by the forced blast method is lessened. The gain claimed from a mixture of steam with atmospheric air is often defeated or changed into a direct loss by the use of too much steam. It may be regarded as a pretty well established fact (although really an open question, as stated) that a little steam is a valuable addition to the blast. Too much steam is bad for two reasons: First, by taking the place of considerable air, consequently preventing the entrance of a corresponding quantity of oxygen, causing carbonic oxide as a resultant, the heat obtained from such combustion being only about one-third of that obtained by perfect combustion; second, by overtaxing the decomposing power of the fire with too large a quantity of steam, which passes through the fire simply as steam, thereby lowering the temperature of the gases above the fire in many cases below the point of ignition, or if the temperature is not reduced to that degree a volume of vaporous flame of low temperature is the result, due to the mechanical mixing of steam with the burning gas as it passes back under the boiler, nearly the entire product of the fire bed in such a case being carbonic oxide, with only a small quantity of available oxygen present to combine with it above the fire.

Such is claimed to be the action of a certain amount or more than a certain quantity of steam in a furnace fire. It is well known that a large volume of steam is a splendid fire extinguisher, and the manner in which the steam acts is explained in the theory advanced above, whereby the presence of an excess of steam extinguishes not only by cutting off the supply of oxygen, but by mechanically reducing the temperature of the flame below the burning point; in other words, by carrying heat away from the fire until the flame cannot sustain itself.

It is also claimed that the chemical effect of a moderate or small amount of steam is to furnish oxygen by dissociation at a proper point or stratum in the fire, thereby partially preventing the production of carbonic oxide by conversion from carbonic acid gas in its passage through the glowing carbon in the upper zone of the fire. The effect is also to help consume the carbonic oxide which

BLOWER AND EXHAUSTING FAN.

Blower. No.	Grate Surface. Sq. Ft.	Inlet. Diam. In.	Outlet. Diam. In.	Diam. of Pulley. In.	Face of Pulley. In.	Revolutions. Per Minute.	Air Per Minute. Cube Ft.	Horse Power.
00	5	5.	4.	3.75	2.*	3,000	500	....
0	6	5.75	4.75	3.	2.25	2,600	600	....
1	8	6.5	5.75	3.5	3.	2.300	764	.6
2	10	7.5	7.5	3.75	3.5	1,928	1,019	.79
3	14	9.	9.	4.25	4.	1,686	1,427	1.11
4	20	10.5	10.5	5.	5.	1,410	1,900	1.51
5	27	12.	12.	6.	5.25	1.194	2,701	2.1
6	36	14.	14.	7.	6.5	1,018	3,669	2.86
7	48	16.	16.	9.	7.5	878	4,847	3.77
8	62	18.	18.	10.	8.5	766	6,115	4.76
9	80	21.	21.	12.	10.5	671	8.154	6 35
10	100	24.	24.	14.	12.	598	10,702	8.34



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There's money in Sulphite, if you handle it well.

You can't handle it well without good machinery.

It's a good thing to buy machinery of men who have made Sulphite.

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Consultation free.

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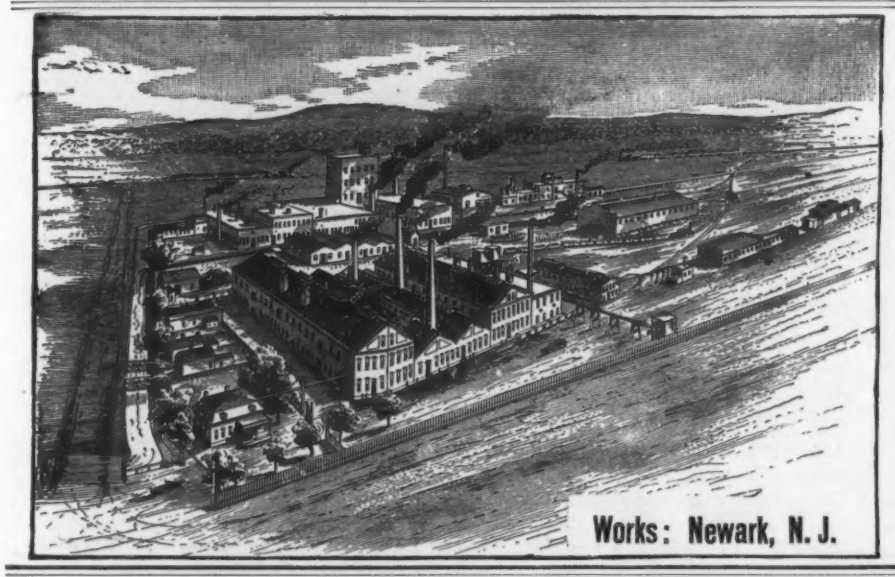

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AUTOMATICALLY KEEP THE DRYERS FREE FROM AIR AND WATER.
INCREASE THE DRYING CAPACITY OF YOUR MACHINES.
GIVE A UNIFORM TEMPERATURE THROUGHOUT THE CYLINDERS.
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NEW ENGLAND ENGINEERING COMPANY, 79 Milk St., BOSTON.

THIS SYSTEM CAN BE APPLIED TO ANY PAPER MACHINE. *ESTIMATES FURNISHED FOR APPLYING SAME.*

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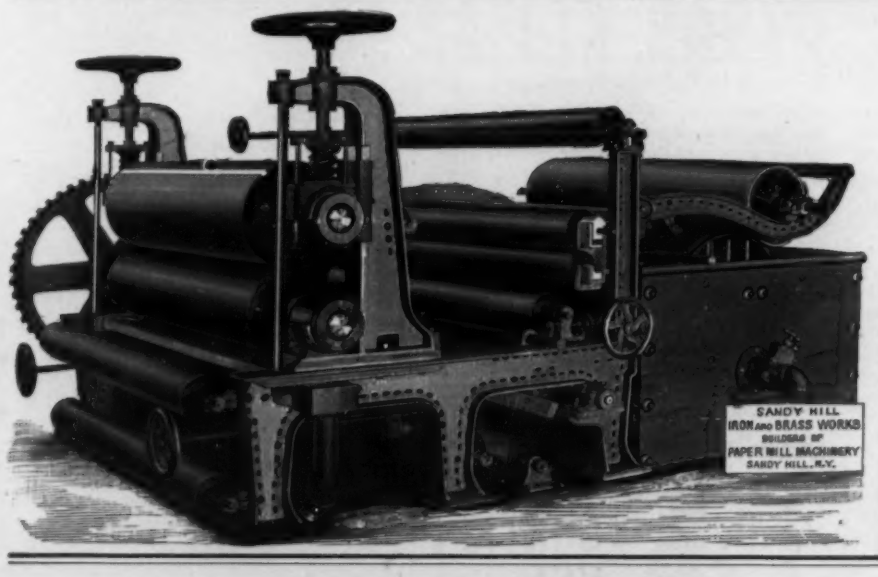
The **Russell Patent** covers every description of Acid Proof Cement Lining and can be applied to any form of Sulphite Digester in use. This Lining for Sulphite Digesters is now in constant operation in many of the largest mills in the country, **more than thirty Digesters being lined with the RUSSELL CEMENT LINING,** and in every case it has given entire satisfaction and proved itself to be a **Perfect Lining.**

IT IS THOROUGHLY ACID PROOF.
IT IS EASILY APPLIED.
IT IS DURABLE AND IMPROVES RATHER THAN DETERIORATES BY USE.
IT PREVENTS RADIATION OF HEAT, AND THUS EFFECTS GREAT SAVING OF STEAM AND INSURES EVEN COOKING OF ENTIRE CONTENTS.
IN THE "ONE METAL" DIGESTER IT PREVENTS CORROSION AND THE DANGEROUS EXPANSION OF THE BRONZE.

Manufacturers of Sulphite Pulp and those intending to build Sulphite Mills are invited to examine into the merits of the *Russell Cement Lining.* Correspondence solicited. All inquiries cheerfully answered.

THE AMERICAN SULPHITE PULP CO., 85 WATER STREET, BOSTON, MASS.

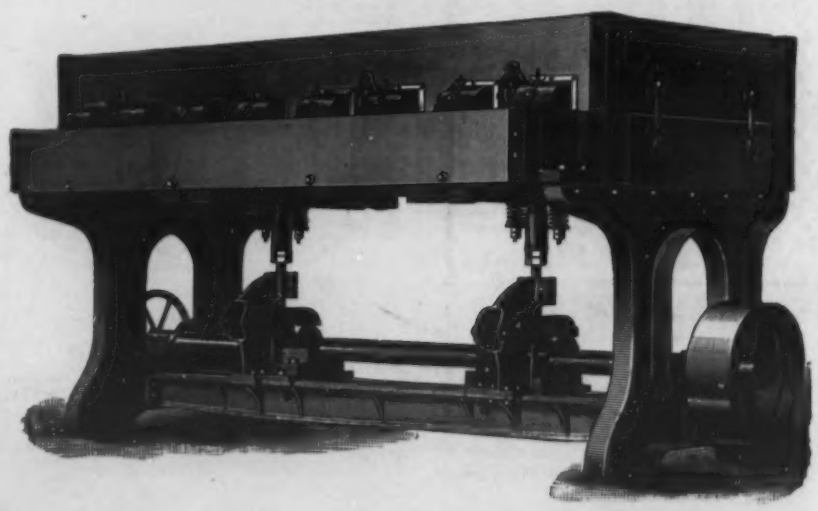


IMPROVED WET MACHINE.

Cut shows our 66 inch Machine, with Brass Cylinder Mold, Rubber Coucher, Spring Pressure Stands, Chilled Iron Bottom and Hard Maple Top Press Rolls, Sprocket Drive. We make this Machine with a Suction Box if desired.

DESCRIPTIVE CIRCULAR MAILED ON APPLICATION.

Sandy Hill Iron and Brass Works,
SANDY HILL, N. Y.



THE MILLIKEN
NOISELESS PULP SCREEN.

SIMPLE, DURABLE, PERFECT, COMPACT.
COMPLETE, NOISELESS, NO STRINGS, LESS POWER.

Plates are sure to last longer, and but two-thirds the number being necessary. No waste of stock when washing up.

Occupies a small space; a simple, solid built flooring the only foundation necessary.
Six (6) hours' time only required to put in position ready for work.
Excellent work accomplished with eight (8) plates and 11-1000 screen plate.
In ordering the Screens no particulars are required.

IT HAS NO EQUAL AS TO SCREENING QUALITIES, CAPACITY AND SAVING OF STOCK.

WARRANTED. THREE MONTHS' TRIAL GIVEN. ADDRESS

C. R. MILLIKEN, PORTLAND, ME.

will or may be formed; for it must be borne in mind that heat is always absorbed in the production of carbonic oxide by conversion (reduction), and it should also be remembered that the oxide formed in this manner must pass off unconsumed, thus losing and wasting its heat value unless oxygen is furnished to combine with it.

The hydrogen set free by dissociation of the steam, or at least a large portion of it, will also be consumed in coming in contact with oxygen at a lower temperature than the point of dissociation, for in addition to the oxygen which has passed through the fire without combining there is always an admission of some air around the fire doors and also through the ventilators in the doors.

The mechanical effect of steam in the air supply is said to be to keep the clinkers soft and porous so that the blast can readily pass up through the entire bed of fuel uniformly, instead of being forced to pass between solid clinkers wherever it can find an opening, thus producing what are generally termed "forge flames" under the boiler. This is usually the effect of a fan blast, for an all-air blast tends to form the clinkers into compact slabs, through which the air cannot pass.

Another mechanical effect of steam is that it moistens the fine ashes from the grate upward as fast as they are made. This serves to fasten the ashes together and hold them in the strata in which they were produced, instead of permitting them to be blown up into the burning surface to choke it by filling up the spaces between the particles of coal. Another effect is to keep the grate bars cool, thereby prolonging their life.

One fact must not be lost sight of, and that is that the "dissociation" (changing of steam into its component gases, oxygen and hydrogen) of steam or water consumes a certain amount of heat; also that "association" of those gases (burning them again) will yield just as much heat as was used in dissociating them. Therefore there is no loss in "burning" a small quantity of water or steam in a boiler furnace, except from the loss of a quantity of the heat units which must invariably escape and be dispersed by radiation during the process of dissociation and burning on uniting again.

Those facts may also be applied to the wetting of coal before putting it into the furnace. There are certain times when the conditions present may permit wet coal to be burned with better economy than could be obtained from the same coal dry, but that does not mean that coal should always be burned wet or dry in all furnaces.

It is very important that the brickwork of a boiler be whole and tight, with no cracks or holes for gas, and consequently heat units, to escape. This point may be appreciated by watching the experts who conduct tests of "safety" and "sectional" boilers, when such boilers are put in and sold under a guaranty to effect a certain evaporation per pound of combustible. The experts mix up some thin mortar, plaster or cement, and proceed very carefully to close every crack and crevice in the boiler setting through which cold air could possibly find its way into the fire box, combustion chamber, back connection, up-take flue or base of chimney. The difference in the evaporation before and after thus stopping off the cracks is frequently a very important factor in the economy of the boiler.

In practice we find many of the most approved forms of shaking and dumping grates (in burning pea and buckwheat anthracite) in use, but there exist signs that the shaking, and more particularly the dumping apparatus has fallen into complete disuse, the fires being cleaned by hand as if ordinary plain grates were in use. The only reason the writer could ever obtain from the very excellent firemen in charge of these grates in explanation of the seeming abandonment of the shaking and dumping devices was as follows, as expressed by a capable but somewhat bigoted engineer:

"The grates are very good ones, but they aren't human; they shake all right and they dump all right, but you can't make them tell the difference between good coal and ash when you are working the dumping lever. As for the shaking, that is all right when you are burning soft (bituminous) coal or the larger sizes of hard (anthracite) and using natural draft; but with small hard coal (pea anthracite) I don't want any shaking of my grates, especially when using the blower. I want the surface of the fire to remain smooth and undisturbed from the time of starting until the fire has to be cleaned. The air has formed channels and passages through the ash and cinder on the grates, and I don't want to disturb and close those passages by any shaking of the fire or grate. And when it comes to cleaning fires there is only one thing to do—the ash and cinder must all come out and the live coal stay in. No dumping grate yet made can do this perfectly, so I have to push the live coal one side, pull out the dirt and level the live coal back again. It is handy to have a dumping grate when you get the fire all pushed one side, for then you can let the ash all down quick; but for small, hard coal I have never yet seen the shaking or dumping grate which would clean a fire without loss of coal or do it as well as an intelligent fireman could. For large hard and for soft coal the dumping and shaking grates are just the thing and should always be used. Some people use and like them for small, hard coal, but I have better results without using the shaking device and using the dumping only after the live coal has been pulled one side."

Such is the opinion of a chief engineer who is making a fine record in burning small anthracite coal in one of the most prominent buildings in New York city.

In some of the patent grates the sliding off business is effected by mechanism very similar to that in use in the United States street mailing boxes for papers and packages—*i. e.*, you can put a bundle into the swing pocket, but the very act of opening the pocket closes the opening to the body of the mailing box, which passage is reopened as the inlet to the pocket is closed. This action prevents anyone from fishing out of the box packages already deposited therein. In the grate it prevents more than a pocketful of grate contents being carried into the ash pit at any one movement of the pocket.

Regarding the cost of evaporating a given quantity of water with coals of various sizes, tests have been made by several engineers, under various circumstances. The data are reproduced herewith and will serve as an excellent basis of comparison. An engineer recently made a series of experiments extending over two or three years, from which he deduces the following:

1887. "Old Company Lehigh" coal (with natural draft) at $4.50 per ton evaporated 9.46 pounds of water with 1 of coal. Steam pressure in all these tests, 90 pounds per gauge. Feed water 185° Fahr., giving an equivalent evaporation from and at 212° of 9.8 pounds of water per pound of coal.

1889. "Clearfield" bituminous (natural draft) at $3.50 per ton, 9.82 pounds of water evaporated per pound of coal, same conditions as above. Equivalent evaporation, 10,198 pounds.

1890. "Buckwheat" coal (forced draft, McClave gates and argand blower), 8.76 pounds water per 1 pound of coal; equivalent evaporation, 9 pounds. Further data showed the evaporation per $1 worth of coal to be as follows: Large coal at $4.50, 4,732 pounds water for $1; bituminous at $3.05, 7,229 pounds water for $1; buckwheat at $1.80, 10,804 pounds water for $1. It may be added that the cost per week, doing about the same work at the same time each year, was as follows: Large anthracite, $110.79 per week; bituminous, $95 per week; buckwheat anthracite, $57 per week.

The following extracts are from data taken from evaporative trials with Oneida pea and buckwheat, on a Coxe traveling grate applied to Stirling boilers, at the "Oneida" mine, No. 3, June 27 to 30, 1893:

Size of Coal.	Pounds of water evaporated from and at 212° per pound of dry coal.	Per cent. of ash by analysis per cent.	Approximate ash from ash pit, per cent.
Pea	8.56	12.55	15.60
Buckwheat No. 1.	7.94	17.35	20.10
Buckwheat No. 2.	8.00	15.50	18.71
Buckwheat No. 3.	8.05	12.90	22.27

The sizes of coal may be estimated from the following table from the Cross Creek collieries:

Size.	Made through. Inch.	Made over. Inch.	Approximate prices at mines.
Chestnut	1½	⅞	$2.75
Pea	⅞	9-16	1.25
Buckwheat	9-16	⅜	.75
Rice	⅜	3-16	.25
Barley	3-16	3-32	.10

From mines to tide water pea coal is charged 30 cents and buckwheat, rice and barley 50 cents per ton freight less than domestic sizes.

A very interesting and valuable table has been compiled by Robert W. Hunt & Co., which gives the cost of evaporating 1,000 pounds of water, the evaporations per pound of coal and the price per ton being stated.

From this table we find that the coal used by the engineer in the 18.87 test cost 23.68 cents to evaporate 1,000 pounds of water, with the evaporation effected, viz.: 9.5 pounds of water per pound of coal.

By looking at the table, we find that coal at $2.50 per ton need only give an evaporation of 5½ pounds to cost about the same per 1,000 pounds of water (22.72 cents against 23.68), and carrying it out to the price nearest cost ($1.80), which is $1.75, it is seen that the cost at only 5 pounds evaporation is only 17½ cents per 1,000 pounds water; but as an evaporation of 8.76 pounds was obtained with the buckwheat, the cost was only about 10½ cents per 1,000 pounds of water.

From the statements given in recapitulation we find that the engineer evaporated 1080 pounds of water at a cost of $1, making the cost 9.4 cents per 1,000 feet, within 1 cent of the cost obtained from the table, and quite close considering that we have been working at a cost of $1.75 per ton in table, and $1.80 with the engineer.

The cost of evaporating 1,000 pounds of water with an evaporation of 8, and cost per ton of $1, is only 6¼ cents, against 17½ cents per domestic coal at $4.50 per ton, a saving of 11¼ cents, or 70 per cent. saving. This is surely a strong argument in favor of moderately small coal. In the Oneida trials the saving in favor of rice or No. 2 buckwheat is still greater.

COST OF EVAPORATING 1,000 POUNDS OF WATER.

FUEL—COAL.

Coal, per ton,	$0.75	1.00	1.25	1.50	1.75	2.00	2.50	3.00	3.50	4.00
Pounds of water evaporated per pound of coal. / Cost of coal consumed in evaporating 1,000 pounds of water.										
5.	.0750	.1000	.1250	.1500	.1750	.2000	.2500	.3000	.3500	.4000
5.5	.0681	.0909	.1136	.1363	.1591	.1818	.2272	.2727	.3182	.3636
6.	.0625	.0833	.1041	.1250	.1458	.1666	.2083	.2500	.2916	.3333
6.5	.0576	.0769	.0961	.1154	.1346	.1538	.1923	.2307	.2692	.3077
7.	.0535	.0714	.0892	.1071	.1250	.1428	.1785	.2143	.2500	.2857
7.5	.0500	.0666	.0833	.1000	.1166	.1333	.1666	.2000	.2333	.2666
8.	.0468	.0625	.0781	.0937	.1093	.1250	.1562	.1875	.2187	.2500
8.5	.0441	.0588	.0735	.0882	.1029	.1176	.1470	.1764	.2059	.2353
9.	.0416	.0555	.0694	.0833	.0972	.1111	.1389	.1666	.1944	.2222
9.5	.0394	.0526	.0657	.0789	.0921	.1052	.1316	.1578	.1842	.2105
10.	.0375	.0500	.0625	.0750	.0875	.1000	.1250	.1500	.1750	.2000
10.5	.0357	.0476	.0595	.0714	.0833	.0952	.1190	.1428	.1666	.1904
11.	.0340	.0454	.0568	.0681	.0795	.0909	.1136	.1360	.1591	.1818

Cost of evaporating 1,000 pounds of water = $\frac{\text{price of coal per ton}}{2 \times \text{evaporation.}}$

Testing Lubricating Oils.

The following summary and easily made tests of mineral oils used for lubrication have been recommended by Crosnier. To determine the flashing point it is sufficient to heat the oil in a porcelain or platinum vessel with thermometer attached, and to try it from time to time with a flame; a good oil should only give out inflammable vapor at a temperature exceeding 100° C., and the liquid itself should not ignite below 200° C. To determine the degree of consistency or fluidity, 10 cubic metres (0.61 cubic inches) of oil should be placed in a small funnel with long and narrow spout, and then heated to a temperature of 100° C.; the number of drops flowing in a given space of time permits of comparison between two oils, or of an oil with a standard, the fewer drops passing the better will be the oil in this respect. To detect the presence of free acids, which are objectionable in lubrication, the above quantity of oil may be intimately mixed with half the quantity of strong alcohol previously heated to 50° C.; after the two substances have been left in contact for several minutes, the alcohol must be decanted, and if a blue test paper plunged therein be not tinged it may be concluded that there is no free acid present.

An easier method for detecting acid is to place the same quantity of oil in a glass (having a foot or stem) with a penny or other copper piece thoroughly scoured; if after remaining in a hot place for several days the copper is not attacked nor the oil discolored it may be regarded as free from acid. To ascertain the density of oils, which generally varies from 0.825 to 0.926, if they are sufficiently fluid at the ordinary temperature, an aerometer will serve; but when they are very viscous the action of the instrument is not sufficiently free, and the following method must be adopted, after roughly determining the density with the aerometer. Into a mixture of water and alcohol having a density equal to that roughly ascertained must be allowed to fall a few drops of the oil, which will sink to the bottom if heavier, or rise to the surface if lighter; but by modifying these liquids with suitable additions of water or alcohol a mixture may be found which will hold the oil in suspension, when it is sufficient to take by the aerometer the density of the alcoholized liquid in order to ascertain the density of the oil to be tested.

The best belting has a firm, solid character, while at the same time it is pliable. As it is the nature of leather to possess a degree of elasticity, it is reasonable that a belt should stretch to some degree under strain, and while a well made belt must be reasonably rigid against stretching in use, yet to take all the stretch out of a belt in its manufacture would imply to strain it beyond the just limit due to its nature.

Strength of Metals.

The utmost strength for a given weight is requisite in many nds of construction, but is especially important in building flying machines. Prof. Robert H. Thurston, in the March *Aeronautics*, discusses various materials with this special object in view, but makes comparisons of interest to other lines of engineering.

At the outset he gives the following generally accepted figures: Cast iron weighs 444 pounds to the cubic foot, and an inch square bar will sustain a weight of 16,500 pounds; bronze—weight, 525 pounds, tenacity, 36,000; wrought iron—weight, 480, tenacity, 50,000; hard "struck" steel—weight, 490, tenacity, 78,000; aluminum—weight, 168, tenacity, 26,000. We are accustomed to think of metals as being stronger than wood, and so they are, generally speaking, if only pieces of the same size be tested; but let equal weights of the two materials be compared, and it will be found that several varieties of wood will prove stouter than ordinary steel. A bar of pine just as heavy as but no heavier than a bar of steel an inch square will hold up 125,000 pounds; the best ash 175,000 pounds, and some hemlock 200,000 pounds. Wood, however, is bulky. It occupies ten or twelve times the space of steel; and for a machine which is to move rapidly through the air, skin friction and resistance of cross section require that the material used shall be as compact as possible. Hence, wood is out of the question.

The best steel castings made for the United States Navy have a tenacity of from 65,000 to 75,000 pounds to the square inch. Whitworth, by solidifying such castings under great pressure, got a tensile strength of 80,000 to 150,000. By "drop forging" no doubt this can soon be paralleled. We now get still greater strength in small pieces. The best tool steel, from ingots, is far superior to ordinary steel castings and forgings in this respect, and fine steel wires and ribbons give a tenacity of 300,000 pounds to the square inch of cross-section.

Ordinary aluminum is only one third as heavy as steel, and a bar of the former, with a cross section of three square inches, would hold up 78,000 pounds, and that is as much as one inch of good steel would do. It has, however, to a less degree the same objection offered to wood, namely, that it is more bulky, and would offer more resistance to the air than steel. Various alloys have been made in which aluminum is the chief ingredient, securing increased strength without materially adding to the weight.

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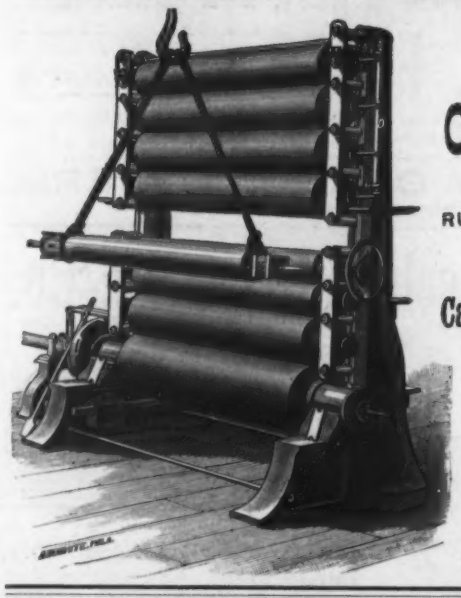

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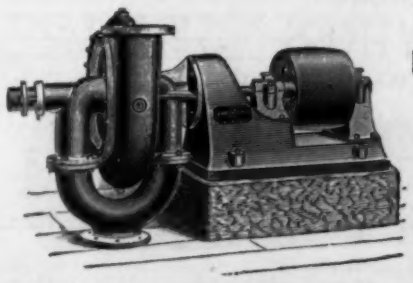

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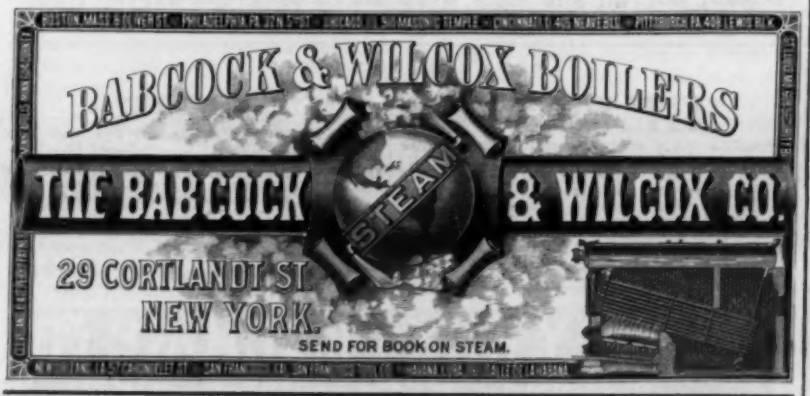

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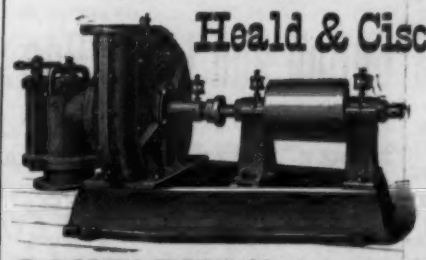

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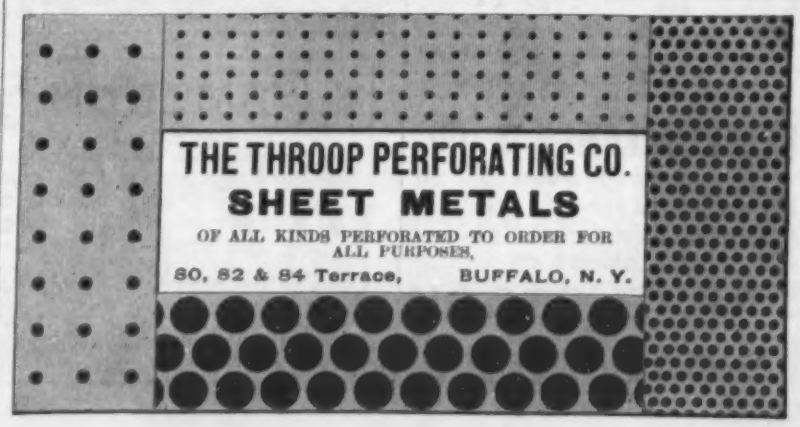

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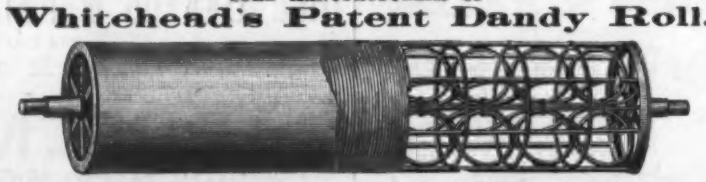

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